

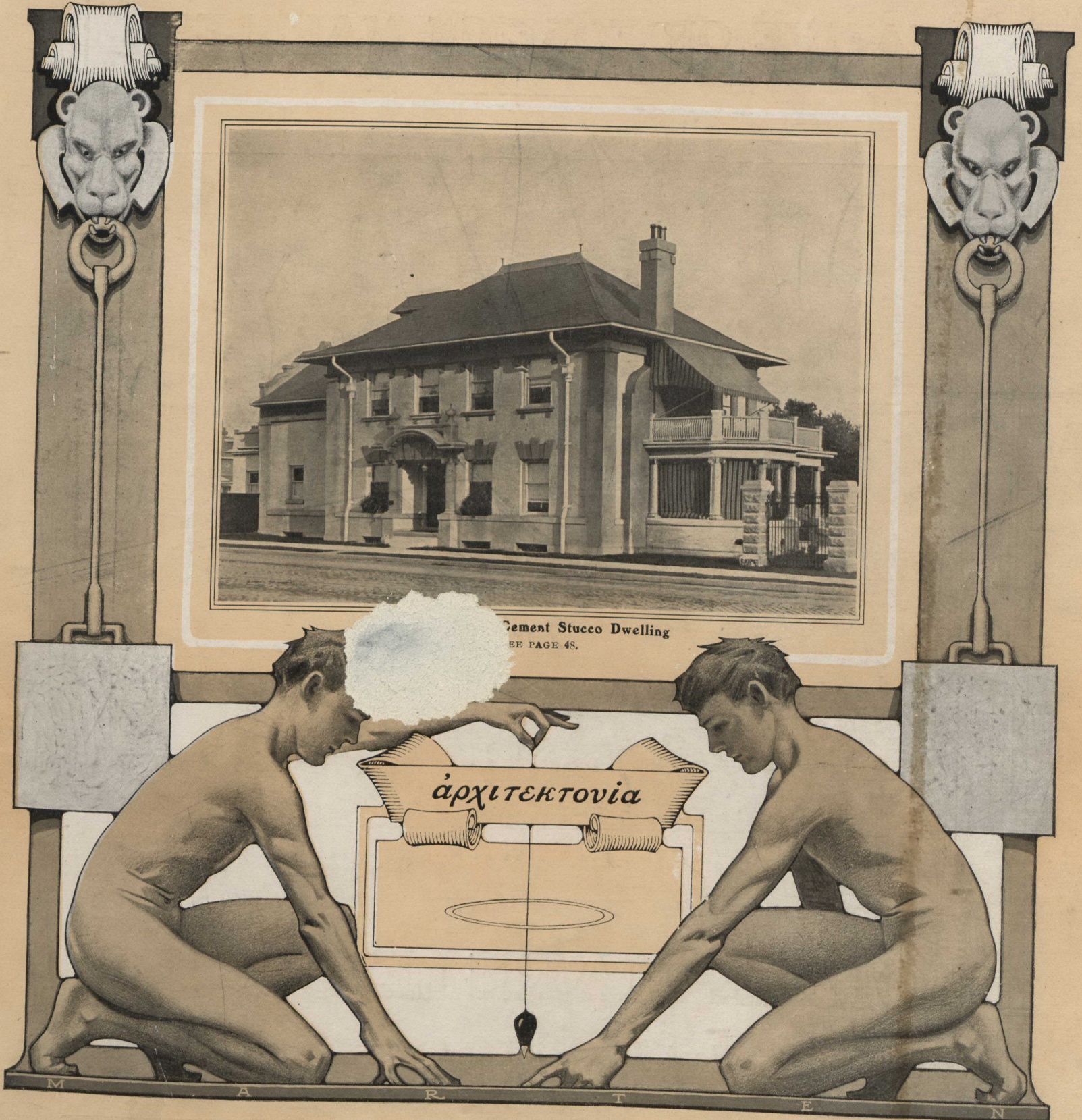
CONSTRUCTION

A JOURNAL FOR THE BUILDING AND
ENGINEERING INTERESTS OF CANADA

Vol. I, No. 5.

MARCH, 1908

\$2.00 PER YEAR
25c. PER COPY



Cement Stucco Dwelling
SEE PAGE 48.

ἀρχιτεκτονία

- MONTREAL -
BOARD OF TRADE BUILDING.

- HEAD OFFICE -
'SATURDAY NIGHT' BUILDING,
TORONTO

- LONDON, ENG. -
BYRON HOUSE, 85 FLEET STREET, E.C.

Entered at Toronto Post Office as Second Class Matter

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TO TAKE CARE OF
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NATIVE OR FOREIGN MARBLES



A Section of Our Works at North Toronto

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100 King St. West, Toronto

'Phone M. 5686

Works :

North Toronto

100 Per Cent. More Than Guaranteed

Bank of Montreal,

Belleville, Ont. January 21st 1908.

Mr. Wm. McGie,
Plumber, etc.,
Belleville, Ont.
Dear Sir,

The two 30-6 Viking Boilers (twinned)
manufactured by Warden King, Limited, and supplied
by you with our new hot water heating system,
have been found highly satisfactory in every way.

Yours truly

R. Macmillan

*Note, The above Boilers
are connected to
2360 square feet of
+ not more than one
Boiler has been in operation
at any one time during
the season. J. M. MacGie.*

The above is a facsimile of a letter from one of the many satisfied users of the **VIKING BOILER**, with some additional information from the heating contractor concerning the installation referred to.

WARDEN-KING, Limited
CLUFF BROTHERS, Toronto
SELLING AGENTS

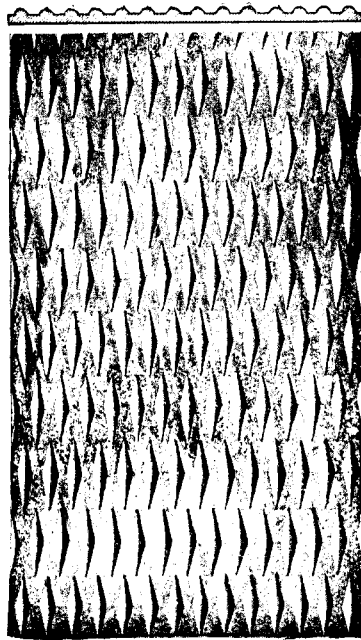
CONSTRUCTION

AMERICAN PRESSED STEEL FLOOR PLATES

RIBBED OR DIAMOND PATTERN

WILL NOT CRACK OR BREAK

50°/o
Stronger
than cast
iron



DIAMOND PATTERN

30°/o
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iron

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**CONDUIT, and GAS FLUE COVERS, STAIR-
WAYS, CELLAR DOORS, STOKE-HOLE
PLATES, ETC., ETC.**

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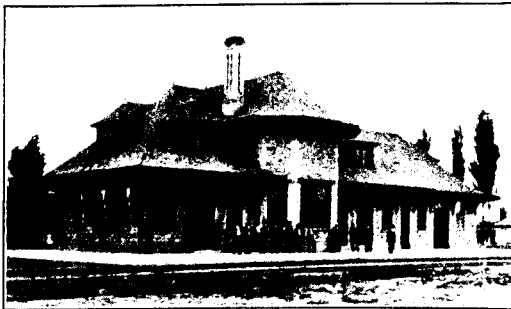
WRITE FOR BOOKLET

DRUMMOND McCALL & CO.

MONTREAL AND TORONTO



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IDEAL MACHINES

The Choice of the

Union Pacific Railroad

When the great Union Pacific Railroad Company selected IDEAL CONCRETE MACHINES for the construction of depots and other buildings along its lines, the choice was based on the same reasons that make the "IDEAL" the favorite of all contractors, builders and manufacturers of artificial stone.

The "IDEALS" simplicity in principle and construction allows greater output, with less labor, than any other machine.

The "IDEAL" is the only machine legally built on the "face-down" principle, allowing a rich facing mixture, with cheaper material at back of block.

The "IDEAL" is adaptable to the manufacture of blocks of various forms, and any desired design of face. The same machine makes blocks of any length within capacity, any angle, 4, 6, 8, 10 and 12 inch widths and 4, 6 and 8 inch heights.

IDEAL CONCRETE BLOCK MACHINES

TWO SIZES :

MODEL " A "

16 INCH LENGTH

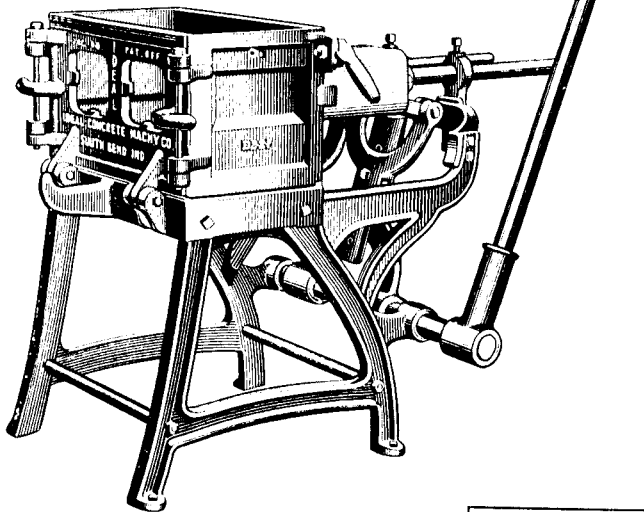
MODEL " E "

24 INCH LENGTH

Interchangeable to

4, 6, 8, 10 and 12 inch Widths

4, 6 and 8 inch Heights



IDEAL FACE-DOWN INTERCHANGEABLE CONCRETE MACHINES

are more than durable; they are practically indestructible in use. Not a chain, spring or cog in their construction. Interchangeable features found in the "IDEAL" alone more than double its range of use and profit.

Other machines in the "IDEAL" line that have become the standard everywhere are Mixers, Brick Machines, Sill and Lintel Machines, Ornamental Column, Spindle, Ball, Sidewalk, Step and Sill Molds.

Our catalogue contains full information on everything pertaining to the concrete industry. Tells how to figure cost, selling price and profit. Gives valuable comparisons of concrete with other materials. Sent FREE on application.

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Factory—221 King St., London, Ont., Canada

Canadian Sales Agents—MUSSENS, Limited, Montreal
Toronto, Winnipeg, Vancouver



Showing the artistic possibilities of "IDEAL" blocks alone, or in combination with brick or other material.



The Largest Staff

The Best Equipped Plant

IN CANADA

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**“The Highest Quality . . .
 . . . The Best Obtainable”**

Fred. Holmes & Sons
 Building Contractors
 1105 1113 Yonge Street
 Toronto, Ont. March 3rd 1908

John M. Bowman, Mgr.,
 The Don Valley Brick Works,
 Toronto.

Dear Sir:-

We write to thank you for the very prompt and satisfactory manner in which our last order to you has been filled.

We also take advantage of the opportunity to express our entire satisfaction with our dealings with you during the past season - not only the efficient service rendered us in delivery, but we must state that the materials supplied us, including Semi-Vitrified wire cuts, grey stock and buff pressed brick, porous brick and terra cotta fireproofing used in the construction of the several large buildings we erected in 1907, were of the highest quality and by all means the best obtainable.

There is no other concern in Canada that could have supplied all these various products, and we feel that not only the quality of your product but the excellent service rendered warrants our acknowledgment.

Yours very truly,
Fred. Holmes & Sons

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**Don Valley Brick and
 Porous Terra Cotta Fireproofing**

- Canadian General Electric Co's. Building DARLING & PEARSON, Architects
- Infants' Home, Sackville St A. W. HOLMES, Architect
- Central Fire Hall, Adelaide St. R. McCALLUM, "
- Grand Stand, Exhibition Park G. W. GOUINLOCK, "

Our product is of the most Superior Quality and is specified by Canada's foremost Architects in the erection of their finest structures

FACE AND COMMON BRICK IN ALL GRADES

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MONTREAL AGENTS :
 DAVID MCGILL
 206 Merchants Bank Chambers

E. F. DARTNELL

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FINE FACE BRICK. Canadian and American, Dry Pressed, Plastic and Plastic Repressed; all colors.

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TERRA COTTA FIRE-PROOFING ORNAMENTAL TERRA COTTA

FINE BUILDING STONES. Canadian, American, English and French, including Bedford (Indiana) Limestone and Ohio Grey Canyon and Blue Sandstone.

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R. I. W. DAMP RESISTING PAINT

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PLASTERER'S STEEL CORNER BEADS

Etc.

Etc.

Etc.

157 St. James Street

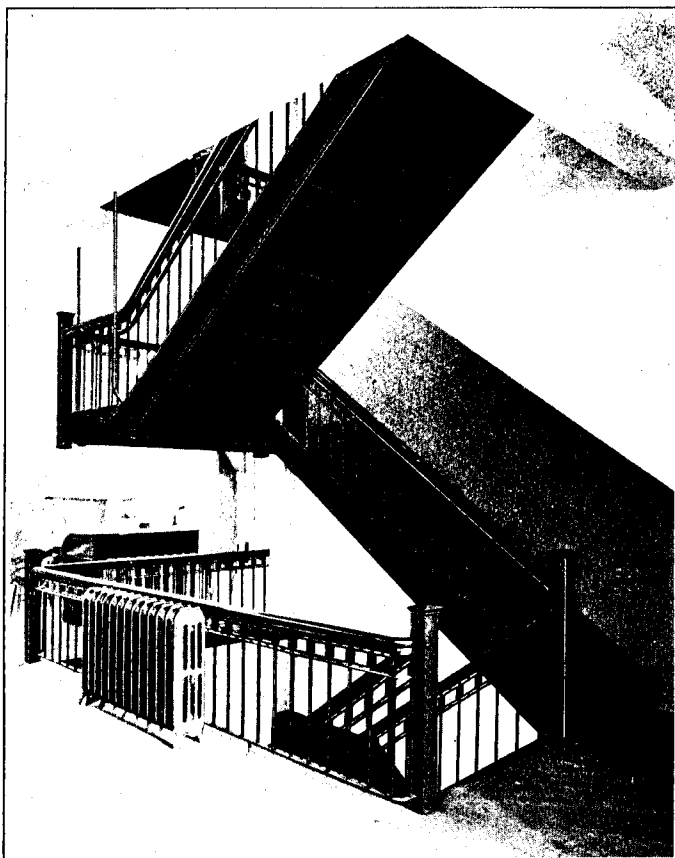
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Montreal



These Stairs were Erected in the McCall Wholesale Warehouse, Toronto.

Lea's Modern Method Stairs

(Patented 1907)

These Stairs are the Neatest, the Lightest, the Strongest Stairs on Earth.

They take less room, bear more weight, last longer, stand more fire than any other.

They are manufactured by *machinery specially designed*.

These stairs are usually made of steel, but when used in private residences, for which they are particularly suitable on account of their neatness, brass or other metal is generally adopted.

As time savers in construction they are invaluable to architects and owners.

For Ocean Greyhounds, Warships and all vessels, where *strength combined with lightness* is indispensable, their value will be understood by Marine Engineers

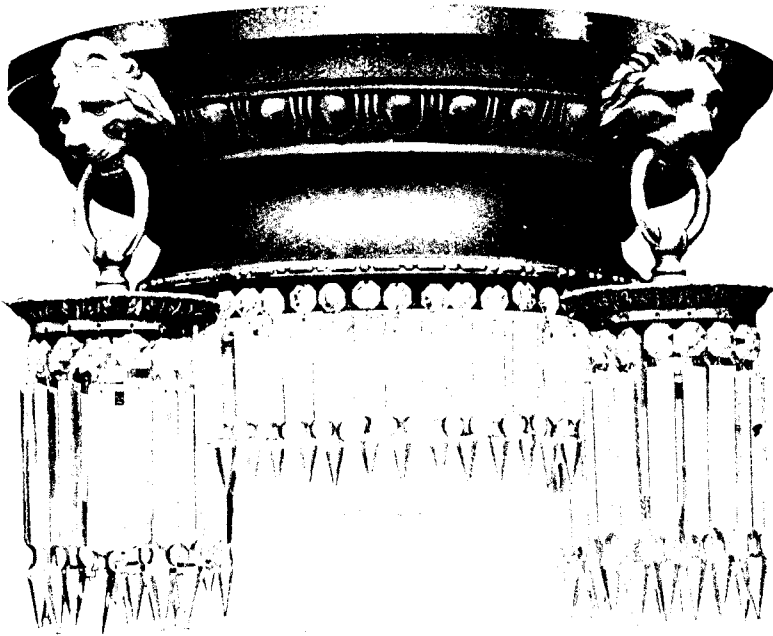
ESTIMATES SUBMITTED WITH SKETCHES AND DETAILS FOR THE PLAINEST OR MOST ELABORATE STAIRS.

CANADIAN ORNAMENTAL IRON CO.,

35 Yonge St. Arcade,
TORONTO.

Phones: Main 4562—Beach 152.

JOSEPH LEA, Manager



Ceiling light combination with prisms

We make an extensive line of

Gas and Electric Fixtures

Suitable for all classes of Buildings
Special Fixtures to designs submitted

**Contractors for complete
Electric Light Installation**



All goods of our own Manufacture

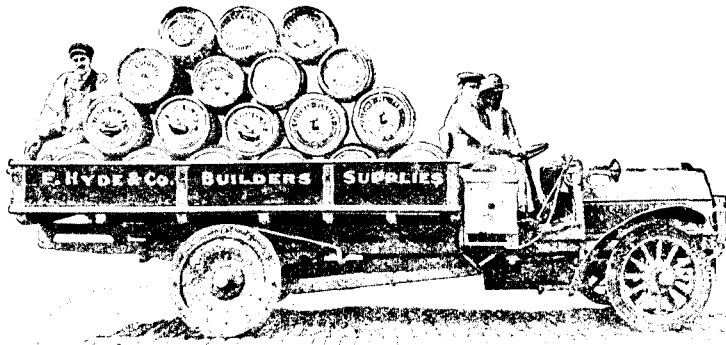


The above cut is a partial representation of our lines of Lighting Fixtures, Engineers' Specialties and Plumbing Goods.

The James Morrison Brass Mfg. Co., Limited

93-97 ADELAIDE STREET WEST, TORONTO

Our
Up-to-date
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Insure
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Deliveries



Standard
Goods
and
Standard
Size
Packages
Only

OUR EXCLUSIVE LINES

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KIRKWOOD AND GLENARD-EN Scotch Fire Bricks.

ART STONE, made from Lafarge Cement.

ADAMANT Wall Plaster.

INTERNATIONAL Portland Cement.

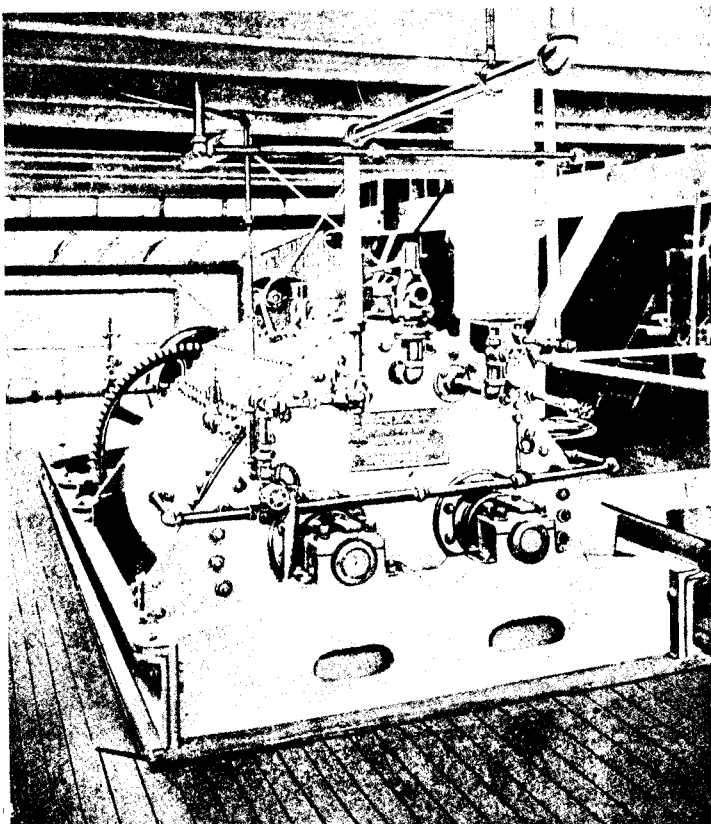
FRANCIS HYDE & CO.

CEMENT, FIRE-BRICK, PIPE, Etc.

31 Wellington St.

Montreal

SAND-LIME BRICK



THE SCIENTIFIC SYSTEM means absolute uniformity in the mixing of materials. This uniformity is the secret of our success, and can only be obtained by the use of our **PREPARING MACHINE RELIANCE**, which has entirely revolutionized the Sand-Lime Brick industry. Before this machine was constructed by **THE SCIENTIFIC SYSTEM** the raw materials were handled in a slipshod way, everything being done by guess work. This machine alone has made it possible to properly prepare the raw materials, and do so in definite and absolutely known quantities. Without this machine it is impossible to make the best Sand-Lime Brick.

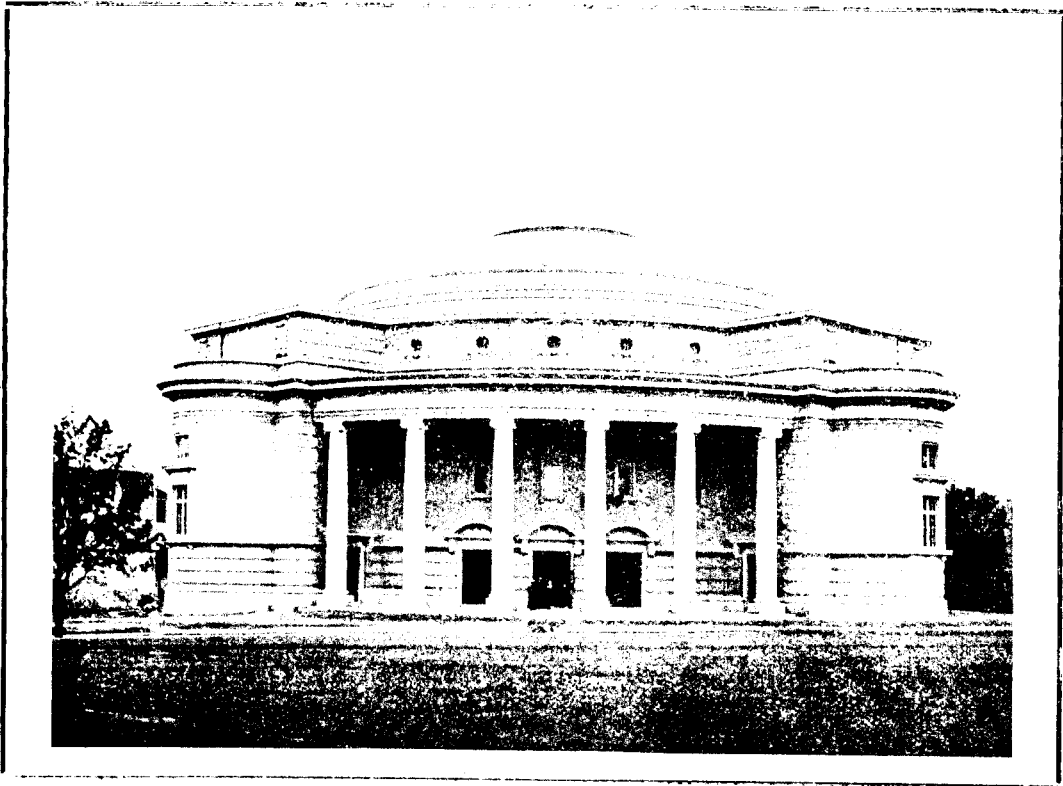
We will design and equip your entire plant.

Write for catalogue and particulars.

The Scientific System Brick Company

79 ADELAIDE ST. EAST,

TORONTO, CANADA



Convocation Hall, Toronto University. Daring & Pearson, Architects.

Expanded Metal System

of construction used in the concrete ground and gallery floors, main staircases and dressing rooms.

The building was plastered throughout with cement plaster on EXPANDED METAL LATH and its domed ceiling, gallery alcove, and arches, were all formed by a steel framework covered with cement plaster on EXPANDED METAL LATH.

EXPANDED METAL is the original metallic mesh concrete reinforcement and will give a greater degree of tensile strength to the amount of metal employed than any other type of reinforcement.

Send for Our Book. A Treatise on Reinforced Concrete Construction.

Free to Architects, Contractors and Builders.

Expanded Metal and Fireproofing Co., Ltd.

100 KING STREET WEST, TORONTO

KAHN SYSTEM

The Kahn Trussed Bar, the acknowledged standard for reinforcing concrete.

KAHN RIB METAL

Specify
**KAHN
SYSTEM.**
You will if
you
investigate.

The Engineering
World has given sub-
stantial endorsement
to the **Kahn Sys-
tem** in thousands of
buildings erected at
all points on the
globe.

If you plan to build—
investigate the practical
advantages and economies
of the **Kahn System** of
construction — absolutely
fireproof, eliminates cost
of maintenance, reduces
insurance, saves time in
building, grows in strength
and quality with age.

Investigate — Your
interests are greater than
ours, your money, your
investment is concerned—
find out. Know what the
Kahn System of con-
struction means — that it
operates in accord with
your architect, engineer
and contractor, without
extra cost to you. Why
not profit by this combined
knowledge and experi-
ence?

Trussed Concrete Steel Company of Canada, Limited

LONDON, ENG.

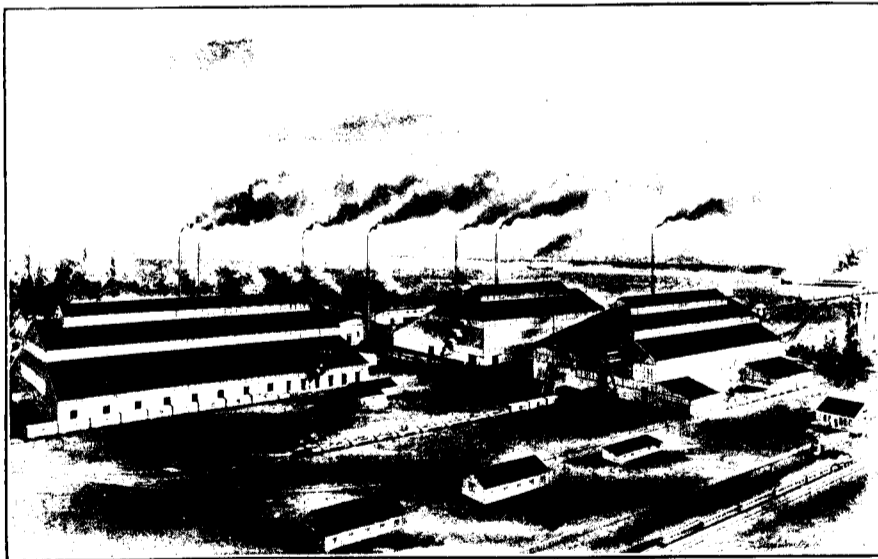
23 Jordan Street, TORONTO.

DETROIT, U.S.A.

WALKERVILLE, ONT.

BUILD KAHN SYSTEM --- IT WILL ATTAIN --- ANY DESIRED RESULT

ONTARIO IRON AND STEEL COMPANY, Limited



NEW PLANT AT WELLAND, ONT.

Manufacturers of Steel Castings, Billets, Bars, Angles
and Light Rails

Traders Bank Building, = TORONTO, CANADA

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CORK
COMPANY**

**INSULATION
DEPARTMENT**

**No other Insulation
meets these requirements**

**CORK BOARD
INSULATION**



Installed in hundreds of
the most modern cold
storage plants, pack-
ing-houses and
breweries in the
United States,
Canada and
Mexico

Write for Blue Print showing details
of construction, also Catalogue and
samples of our Cork Board.

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| Gunn, Langlois & Co., Ltd..... Montreal | Gunn's Limited.....Toronto |
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| Canadian Breweries, Ltd.....Montreal | Calgary Brewing Co.....Calgary |
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ARMSTRONG CORK COMPANY

INSULATION DEPARTMENT
Coristine Building - - Montreal

Roman Stone

IS SPECIFIED BY THE LEADING ARCHITECTS

Over Two Hundred Contracts Were Executed by Us Last Year

AMONG THEM WERE THE FOLLOWING:—

Horticultural Building, Toronto Exhibition, G. W. Gouinlock, Architect.

Imperial Bank, Bloor West, Toronto, John M. Lyle.

Two Apartment Houses, Montreal, Macvicar & Heriot.

Metropolitan Bank, Streetsville, Darling & Pearson.

D. McCall Warehouse, Toronto, G. W. Gouinlock.

Standard Bank, Belleville, Power & Son.

Standard Bank, Cobourg, Power & Son.

Standard Bank, Brantford, Power & Son.

Sarah Maxwell School, Montreal, A. F. Dunlop.

Earl Grey School, Montreal, A. F. Dunlop.

Imperial Bank, King East, Toronto, Darling & Pearson.

Royal Bank, Pembroke, H. C. Stone, Architect.

Bank of Nova Scotia, St. Catharines, Bond & Smith.

Church of St. Mary Magdalene, Toronto, Darling & Pearson.

Central Presbyterian Church, Hamilton, John M. Lyle.

Bank of Montreal, Eglinton, Peden & McLaren.

Bank of Montreal, Sudbury, Peden & McLaren.

Bank of Montreal, Hull, Peden & McLaren, C. P. Meredith.

Princess Theatre, Montreal, Finley & Spence.

Bank of Commerce, Wingham, Darling & Pearson.

Presbyterian Church, Cheltenham, John M. Lyle.

Estimates Promptly Furnished on Receipt of Drawings

THE ROMAN STONE COMPANY, Ltd.,

T. A. MORRISON & CO.,

Sales Agents for Quebec,

204 St. James St., MONTREAL.

100 Marlborough Ave.,

TORONTO

DUNLOP packing

Dunlop packing is the rubbery kind that may be used over and over again and still make a tight joint. Wherever packing is required there is a Dunlop sort made for that particular purpose.

Write for a sample piece of the kind you may be needing to-day.

The Dunlop Tire & Rubber Goods Company

LIMITED

Head Office and Factory:—Booth Ave., TORONTO



BROKEN ASHLAR ARTIFICIAL STONE

MADE BY

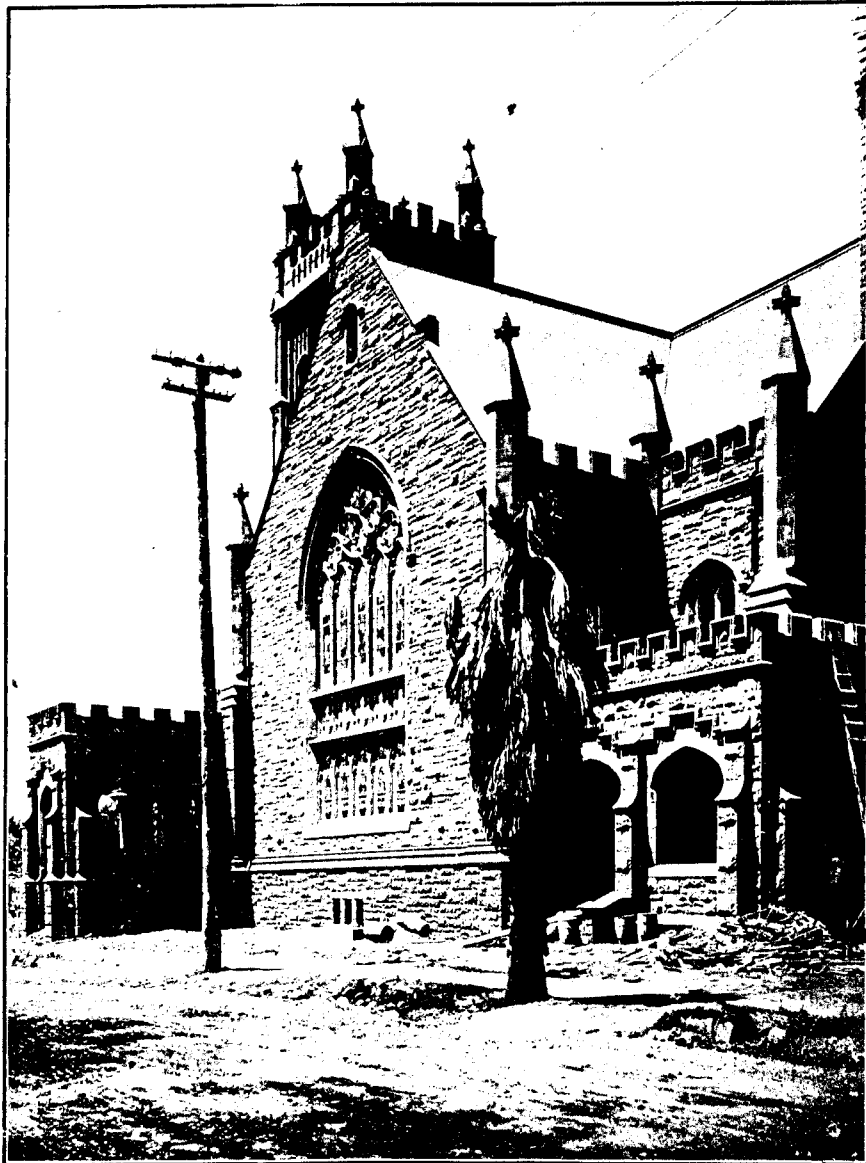
THE CALIFORNIA SYSTEM

At the Buffalo Convention we were repeatedly confronted with the accusation that we were practising a deception, and that the wall of Random Ashlar, built around our space was real cut stone, and not made from concrete as we claimed. Reason—our face plates are made from a plastic composition which reproduces the natural texture of the real cut stone.

REAL RANDOM
ASHLAR

STONE ANY FRAC-
TIONAL SIZE CALLED
FOR, TO MEET
ARCHITECTS' DE-
SIGNS WITHOUT
CHANGE

ANY SPECIFIED DE-
SIGN, REGARDLESS
OF DRAFT OR DEPTH
OF UNDERCUTS



PRESBYTERIAN CHURCH, PASADENA, CALIFORNIA. (Partial view.)

ORNAMENTAL
WORK
OF ALL KINDS
FRIESE, OR BELT
COURSES
BALUSTERS
COLUMNS
CAPITALS
BRACKETS
CROCKETS
GARGOYLES
FINIALS
ENRICHMENTS
LANDSCAPE DECOR-
ATION FOR PARKS
AND ESTATES

A fair example of what we can turn out in the line of Broken Ashlar. In our Random Ashlar there are no blind joints. The California Machine turns out artificial stone from the 4 in. x 4 in. snack up to stone having 14 in. x 36 in. face.

We install the California System anywhere under the positive guarantee that it will give all the results that we claim for it.

We erect large buildings any place where our system has not been installed.

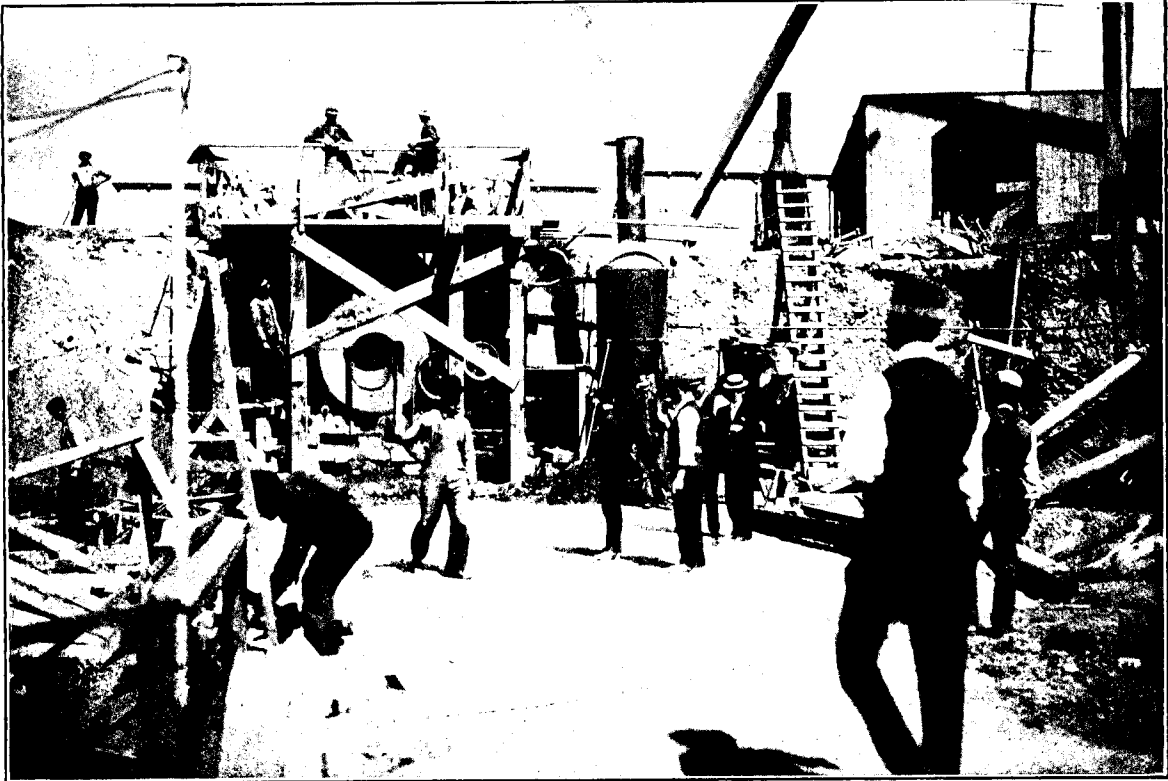
We supply moulds according to designs submitted for any work that you have in hand.

OUR MOTTO—Each and every piece of work different, made practical by the low cost of operating by the California System.

WRITE US FOR PARTICULARS

CANADIAN CONCRETE MACHINERY COMPANY, Limited

Office: 510 Board of Trade Building, TORONTO, ONT.



No. 3 Ransome Concrete Mixer, owned by the Canadian White Co., Montreal.

Recognizing the Fact

that most contractors and engineers are aware of the general principles of the **Ransome Concrete Mixer**, and that it is only in details where improvements and increased efficiency can be looked for, we have issued a new "Ransome Handbook of Concrete machinery." This Handbook describes fully in detail the latest Ransome Concrete Mixer, Model 1908, which retains all the simplicity of previous models, but is made more nearly wear-proof than ever. The universal and long use of Ransome Mixers has brought to our attention all the defects that existed in our early models—and there is no denying that it takes years to perfect any machine—so that the purchaser of a 1908 Model Ransome Mixer, buys not merely a mixer but the experience of a firm that antedates all others by a decade.

Our Handbook gives working drawings of many concrete mixing plants designed for special purposes, a feature that will be of great use to any contractor or engineer who is laying out a plant for the economic making of concrete.

This Handbook is free—sent upon request—to any contractor, engineer or interested party.

F. H. Hopkins & Co

SUCCESSORS TO LATE JAMES COOPER

CONTRACTORS', RAILWAY, MINING AND MUNICIPAL SUPPLIES

Montreal

'CONSTRUCTION'

A JOURNAL FOR THE BUILDING AND
ENGINEERING INTERESTS OF CANADA

Vol. 1

March, 1908

No. 5

CONTENTS

Editorials :

"Close Corporation" Clause Eliminated	21
"In Unity There is Strength"	22
Architects' Names and the Daily Press	22
Montreal Building Statistics for 1907	23
Dishonest Application for Building Permits	23
Building Operations Without Permits	24
Report of Quebec Bridge Commission	24
Skyscraper Construction— Good and Bad (<i>Illustrated</i>)	25
Proposed Henry Hudson Memorial Bridge (<i>Illustrated</i>)	29
Application of Concrete Piles (<i>Illustrated</i>)	32
Gothic Design in Regina Competition (<i>Illustrated</i>)	39
Actual Workings of Specimen Architects License Law (<i>Illustrated</i>)	44
The Cement Stucco House (<i>Illustrated</i>)	48
Fallacy of Municipal Ownership	53
Characteristic Interior Decoration (<i>Illustrated</i>)	56
Evil Effects of Competitive Tendering	60
Fire Prevention and Other Things	62
Single Pipe Gravity System (<i>Illustrated</i>)	67

Departments :

Current Topics	35
Architectural Review	39
Correspondence	65
Plumbing and Heating	67
Prospective Construction	69
Machinery and Trade	76

Minor Items of Interest

Irish Round Towers	28
Skyscrapers, 100 Storeys High	31
Sanitary Wall Beds	31
University Scholarship of the Architectural League of America	52
Novel Church Spire Construction	52

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H. GAGNIER, Ltd., Publishers

Saturday Night Building

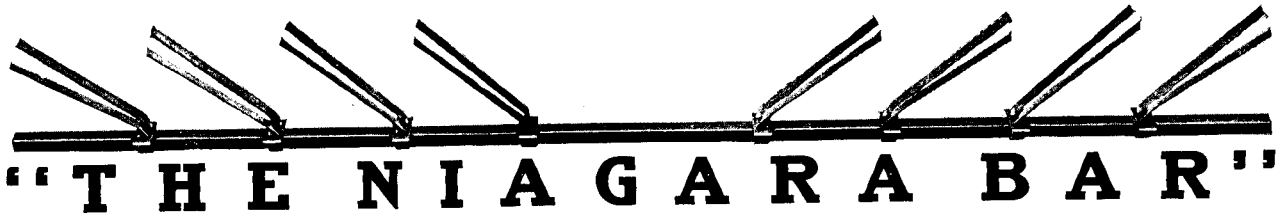
TORONTO

CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building

LONDON, ENG.—Byron House, 85 Fleet St. E.C.



WE have presented to the readers of “Construction” in our previous advertisements, an outline of some of the advantages of the “NIAGARA SYSTEM” of CONCRETE REINFORCEMENT, also some Construction photographs, showing its application

☐ We wish, however, to take up the **LOW COST** side of the System, and show that we have produced results as compared with other work in **REINFORCED CONCRETE**.

☐ **IN THE FIRST PLACE**, the “NIAGARA BAR” is fabricated from stock shapes of Commercial Medium Open-Hearth steel in squares and flats, thereby taking **BASE PRICE** at all times.

☐ **IN THE SECOND PLACE**, the fabrication is so simple, and the machine work is so small in amount, that the **COST** is maintained at a correspondingly **LOW POINT** throughout the entire work.

☐ **THESE FACTS** have enabled us to produce a building in the “NIAGARA SYSTEM,” containing 95,000 square feet of floor space, at a cost of approximately \$1.08 per square foot.

☐ **THE ABOVE COST** is lower by 16 cents per square foot than any other reinforced concrete building of which we have record, and which, by size and generally similar characteristics, has enabled a comparison to be made. We know of no other building which approaches the tannery of Clarke & Clarke, Limited, Toronto, in this respect.

☐ **OUR EXPERIENCE; OUR ORGANIZATION; OUR ENGINEERING SERVICES;** and finally, **OUR LOW COST “NIAGARA SYSTEM,”** are at the service of the professional and constructing public, who are interested in **FIREPROOF** architecture and construction.

☐ We are always glad to answer enquiries concerning **LOW COST FIREPROOF CONSTRUCTION**.

PIT T & ROBINSON

Architects and Engineers

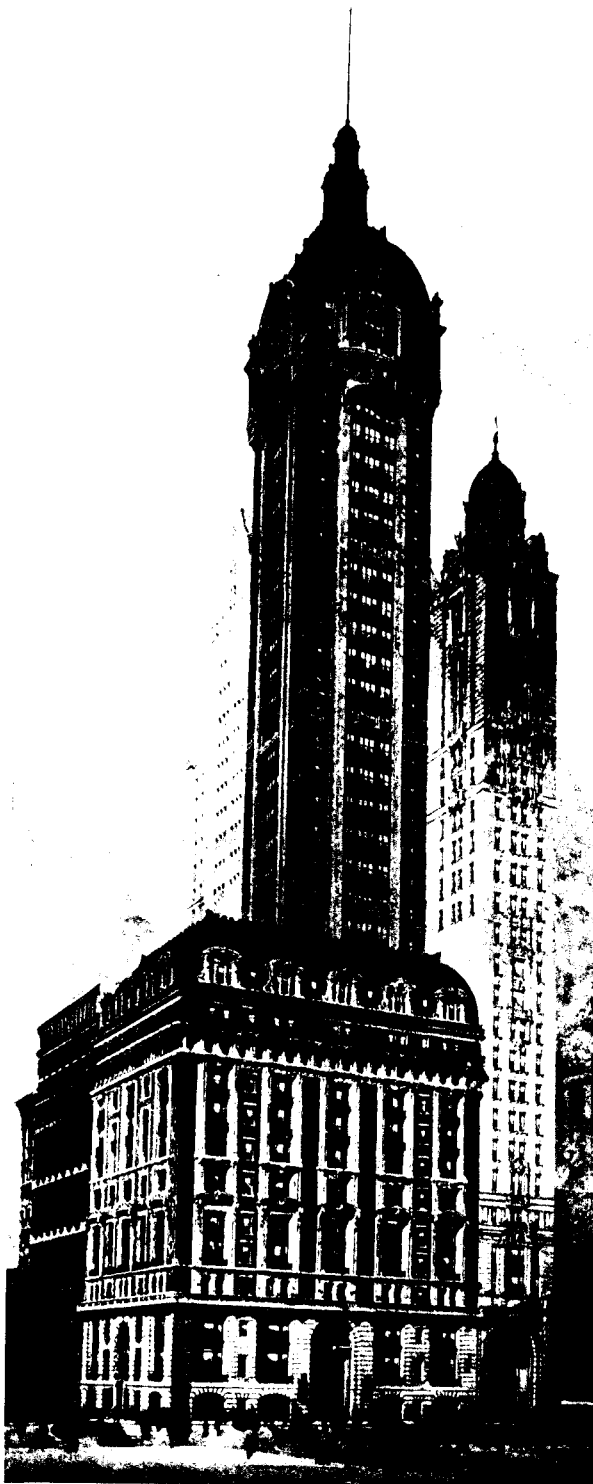
MANNING CHAMBERS

TORONTO

- - -

CANADA

OTIS—ELEVATORS



Made possible the
New Singer Building
in New York.
Forty-two (42) stories
high from the
street level

This building was equipped with
Otis Traction Type Elevators,
the latest development in the
solution of modern extreme
elevating problems. This type
of machine, providing high speed
and exceptional car travel with
facility for perfect control, best
meets the requirements of eleva-
tor service for this towering
structure.

This type of Elevator installed in
Canada by

Otis-Fensom
Elevator Company
Limited

HEAD OFFICE - TORONTO
Traders' Bank Building

Montreal Office - 368 St. James St.
Winnipeg Office - - - McRea Block

CLOSETS

For Every Class and Style of Building

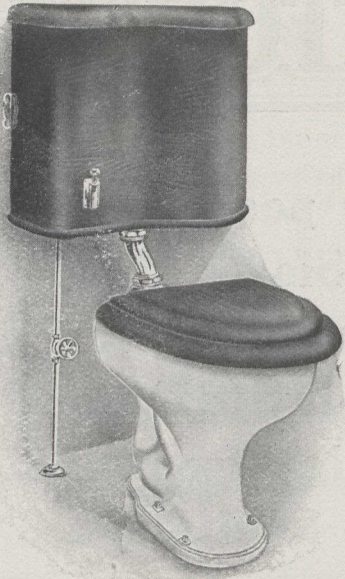


Plate 508E.—Metropolitan Square Back, Syphon Jet Closet, with Recess Veneered Piano Polished Tank and Seat, with Stop Valve on Supply.

**Superior
Solid
Porcelain
Ware**

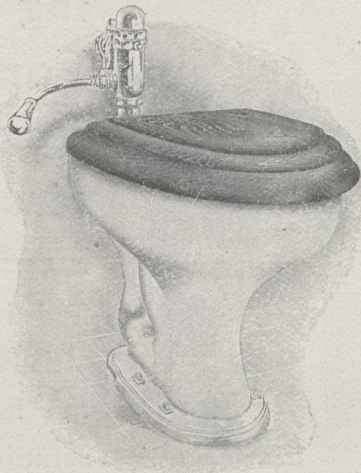


Plate 504E.—Metropolitan Square Back, Syphon Jet Closet, with Lever Action Aquameter and Piano Polished Seat.



Plate 526E.—Ontario Syphon Jet Closet, Piano Polished Tank and Seat, with Stop Valve on Supply.



Plate 511E.—Ontario Syphon Jet Closet, with Veneered Piano Polished Tank and Seat, with Stop Valve on Supply.

**High
Grade
Enamelled
Iron
Ware**



Plate 522E.—Majestic Syphon Wash-down Closet, with Tank and Seat Complete.

Our line of Plumbing Fixtures is the largest and most complete in Canada

SOMERVILLE LIMITED

Head Office
59 Richmond St. East

TORONTO

Brass Plant
Bloor St. and St. Helens Ave.



THE question as to the advisability of granting a charter to the Institute of Architects of Canada, making it a close corporation, has been rendered practically a dead issue by the decision of the officers of the Institute deciding to strike out of the bill, now before the Dominion House, the clauses limiting the right to practice architecture to the members of that organization.

The Institute now only asks for "CLOSE CORPORATION" the passage of an act of incorporation under the Dominion laws to make it a legally responsible organization, which legislation should receive material support from every architect in Canada as well as the hearty indorsement of every patriotic Canadian who has the future beauty and stability of the architecture of this young country of ours at heart.

Since the decision of the architects assembled at the first annual convention of the Institute of Architects of Canada, held in Montreal, August 19th to 24th of last year, to ask the Dominion Government for a charter giving it (the I. A. C.) the right to control the title of architect, there has been much discussion on the subject of "registration of architects" generally, and the "close corporation" idea has met with a vast amount of opposition from many very prominent members of the profession in Canada.

Even at the Convention the charter, as drawn up by the provisional board, was strongly opposed by several well-known architects. The promoters of the movement, however, were more active than those who opposed it, with the result that the Convention indorsed the objectionable clauses in the proposed bill to be presented before parliament. It was made to appear, by the large number of names of representative men in the profession, that were appended to the appeal to parliament for the passage of the act, that it had the almost unanimous indorsement of the profession in Canada. The strenuous opposition that developed in different parts of the Dominion later showed that although nearly every architect of high standing was in favor of some form of "registration" they were not in accord with the method adopted by the I. A. C. to secure such "registration."

The Province of Quebec Association of Architects declined to indorse the proposed act, while some of its prominent members openly declared themselves as being unqualifiedly opposed to it.

The Ontario Association of Architects, at its last convention, failed to put itself on record in favor of the "close corporation" idea, and in the discus-

sion relative to their own bill before the Provincial Parliament it was demonstrated that this form of "registration" was not favored by a large number of its members.

The Toronto Architectural Club, in a resolution, which was unanimously carried at its annual meeting on December 3rd, declared that while "not opposed to a proper form of 'registration' of architects, based on education and under Government control," it was opposed to the form of "registration" proposed by the Institute of Architects of Canada.

In face of this opposition and lack of support on the part of these prominent architectural bodies, is it to be wondered that the daily press and lay public objected most strongly to the granting of such powers to a private corporation? CONSTRUCTION since its first issue made its appearance, has devoted considerable space every month to the discussion of this important subject and has endeavored to give its readers the most authoritative information and representative views on both sides of the question. We assumed the position editorially that it was a mistake to ever have inserted the "close corporation" clauses in the bill. First, because it is unnecessary and unwise to place in the hands of any corporation the regulation of the practice of architecture, to bring about measures to provide for the proper education and "registration" of architects, and that a law, modeled after that of the "Illinois Architects' License Act," which has proven highly successful in its operation for a period of ten years, would best suit our requirements and would contain none of the extremely objectionable features of the form of "registration" proposed by the I. A. C.

OUR POSITION ON THE QUESTION.

Secondly, we assumed this position because it is against the spirit of the times to enact any law that will have a tendency to place the control of any profession or business in the hands of any corporation, and that the insertion of these "close corporation" clauses would unquestionably defeat the whole bill, besides having a tendency of prejudicing the public against any future legislation the architects might ask for.

A great work awaits the I. A. C. and its incorporation as a responsible organization under the Dominion laws should be the forerunner of a great career of usefulness.

There was reason why many members of the profession as well as the lay public generally should

oppose the "close corporation" idea as embodied in the charter originally asked for by the I. A. C., but there is no plausible reason why every reputable architect in Canada and every lover of beauty and stability in architecture should not enthusiastically endorse an equitable law providing for a government board of examiners before which all persons who aspire to follow the profession of architecture in Canada should be required to qualify.

It is most important that the men who are to be responsible for the architecture of our country should be qualified to fulfill that which is required of them. Such a law would promote architectural education and elevate to a higher level the standard of Canadian architecture.

As suggested by Mr. Chausse in his communication, (published in February CONSTRUCTION) after a charter has been granted the I. A. C. there should be a joint meeting of all the architectural bodies in Canada for the purpose of considering a Dominion Architects' License Act of the same character as the Illinois law and that at this meeting some unanimous action be taken toward the formation of a measure that would provide for the governmental "registration" of architects and still be without the highly objectionable feature of appearing to place any arbitrary powers in the hands of some clique of men or private corporation. This is quite possible if every delegate to such a meeting goes there with this one purpose in view at the sacrifice of any personal desire he may possess to have the organization to which he belongs hold a string to the powers asked for.

The architectural bodies must be unanimous and sincere in whatever course is decided upon or they can never expect the government to deal with them seriously.

The officers of the I. A. C. deserve much credit for the responsibility they have assumed in striking from the bill before parliament these objectionable clauses. They have undoubtedly "saved the day" in what looked to have been a lost fight, and the usefulness, which shall undoubtedly attend the future efforts of the Institute of Architects of Canada will be credited to a great extent, to the efforts of these men who have risen at the last moment to the necessity of the occasion.

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IN establishing a national association to embrace every builders' exchange in the Dominion of Canada, the efforts of the promoters to bring this project to a successful issue have by no means become effete, and it is their intention to carry on the work until the permanency of the organization is assured.

The Canadian National Association of Builders had its inception in Toronto on last Labor Day, when representatives of several exchanges in the Dominion met in convention for the purpose of founding this institution. The exchanges actually represented at this meeting were Winnipeg, London, Hamilton, Toronto and Montreal and the delegates named one representative executive officer on the council for each exchange present, and one vice-president for each of the provinces represented, viz.,

"IN UNITY THERE IS STRENGTH."

Manitoba, Ontario and Quebec. Following the convention, copies of the official minutes of the Toronto meeting, together with circular letters requesting that a delegate to the executive council be elected without delay, were mailed to the executive officer of every exchange in Canada. The limited number of responses received to this letter has occasioned Mr. J. H. Lauer, the general secretary, in a recent communication, to deplore the apathy so prevalent throughout the country regarding this important project. Why this lack of enthusiasm should be so manifest is incomprehensible to anyone who has given the object of the association mature thought. Surely an enterprise of this kind, so vital to the builders' welfare, should not go begging for support.

There is a great need for an organization along this line in Canada, and the benefits to be derived from its existence are manifold, to say the least. Not only will it be an important factor in the increasing building activities of the Dominion, but by an interchange of views, active interest, and concerted action, its instrumentality will be felt in procuring the enactment of just laws for the protection of the contractor in both the Federal and Provincial branches of government, as well as safeguarding the interest of the builder from the unjust demands or dictation of organized labor. Furthermore, it is the object of the association to improve the relation between the architect and contractor by the adoption of a uniform contract, which shall be just to all parties concerned; to promote trade schools and technical training of mechanics; and to open free registry offices for labor in every exchange in Canada. All in all, the advantage accruing from an organization of this character are many, and it is the duty of every exchange in Canada to fully discuss the advisability of affiliating itself with this association. It would be lamentable, indeed, if so worthy a project should be permitted to fall into a state of desuetude for the want of proper encouragement.

**

AN element of country journalism still obtains in many of Canada's largest daily newspapers. The editor or reporter grinds out his daily news and thrashes out his editorial effusions pretty much in accord with the policy influenced by the man who "gets the ads."

This vestige of provincialism in our daily press is rather pronounced in its policy with regard to the publishing of the names of the architects or engineers in connection with an illustration or description of their work. The reason for this narrow policy is that the "ad. man" insists that to give an architect due credit in connection with some praiseworthy work he may have executed is to give him free advertising. Such a contention is worse than absurd. If an architect is responsible for the erection of a structure which the editor, in the prosecution of his noble duty, finds cause to criticize the "ad. man" has nothing to say about connecting the name of the designer with the story and the editor finds it his duty to tell the public the name of the man who was wholly or partially responsible for the architectural monstrosity or the engineering failure. Why then should not the name of the man who produces a praiseworthy piece of work, who is responsible for the erection of a building that

ARCHITECTS' NAMES AND THE DAILY PRESS.

graces a community with its architectural beauty, or enriches it with a substantial, well-built, well-planned addition to its commercial architecture, be made known to the public through the press? Why should the architect be asked to pay the press for telling the public that which they are interested in and have a right to know?

Editors would never think of reviewing a book without giving the name of the author or publishing a cut of some masterpiece in art without the name of the painter, or give an account of the unveiling of a monument without giving the name of the sculptor. The public has just as much interest and even more in knowing who designed the buildings erected in their midst as in the names of the authors of their books, the painters of their pictures or the sculptors of their monuments.

In every daily paper there are reports of social gatherings, civic functions or public events, in connection with which there will be published the names of officials, committeemen or just plain citizens, the newspapers seeming to delight in associating some names with a news item, whether it be a runaway match, a reunion of the Smith family, or the launching of a motor boat. But when it comes to a matter of a work of art, to a notice of a public building, to a description of some architectural success, it seems as if our daily press is determined to wholly avoid the use of certain names, and ignore as completely as possible the architect, the builder and those who are really responsible for the work. Indeed it seems almost as if the more pronounced the architectural success, the less willing are the papers to associate with it any name. Entertainment committees, reception committees, committees of ladies, or even sexton's names appear to have a legitimate and welcome place, but the architect who may have worked for months and produced a genuine addition to the civic and municipal art, is conspicuous by his absence.

Where there are a dozen who would watch for the name of the chairman of the building committee, or the names of the ladies who are

PUBLIC INTEREST IN GOOD ARCHITECTURE.

there would be a hundred who would have a direct personal interest in knowing who is the architect or who is the builder; and as a matter of news to the public, leaving aside entirely the architect and his feelings, it ought to be an accepted fact that in any printed description of a building, the name of the architect and builder is of more importance than any other single item.

There is a deeper reason, however, why the name of the creator of a piece of architecture should be made public in connection with any reference to a building. The architecture is too closely connected with the life and growth of civilization to be disregarded, and the extent of public appreciation of good architecture is, after all, a pretty precise index of the measure of civilization and culture. A disregard of the personal element in our architecture implies a lack of appreciation of what architecture really is, a lack of interest in architecture as a creation, and an unwillingness to recognize the force of individual effort in the development of our national growth. To that extent the action of many of our newspapers often rising from mere neglect or oversight on the part of uninformed reporters, is more

often the result of a deliberate policy, which indicates a lack in public sentiment and appreciation.

The public has a right to know who is responsible for these buildings. The architect has a right to have his creations recognized and known as such and if they are wrong or bad he should receive in his own name the onus and the blame, just as when they are right he should receive the credit and the praise.

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PROFOUND knowledge of mathematics—born, no doubt, of long experience as estimators—has enabled the members of the Montreal Builders' Exchange by a unique process of computation to place the amount expended for new buildings and improvements in that city last year at a total twice as great as that shown by the official figures. While mathematics have been accepted as an exact science ever since the streets of Athens resounded with the glad-some cry, "Eureka!", still it is the opinion of the Exchange that figures are sometimes misleading and in support of this contention has embodied in its annual report the following statistics:—

City of Montreal—	
New buildings (official figures)	\$7,552,136
Alterations (official figures)	854,000
<hr/>	
Representing say 60 per cent of actual value.....	\$8,406,229
Add 40 per cent.	3,362,491
<hr/>	
	\$11,768,720
Add suburbs of St. Louis, actual	1,478,660
Delorimer, actual	402,500
Maisonneuve, actual ...	1,504,645
Cote St. Paul, estimated ..	500,000
Outremont, estimated ..	200,000
Westmount, actual ...	893,600
<hr/>	

Total for Montreal and continuous suburbs adjacent

\$16,748,135
The 40 per cent. referred to in the above statement is that portion of the deficit ascribed to the fact that in the majority of cases the real cost of the structure is undervalued when application for a building permit is made. However, the practice is a general one, and if all cities of the Dominion could but add the amounts fraudulently withheld in this manner, Canada would have had a grand total for building operations, greatly increasing the big gain she made in 1907.

**

IT is often said that every man has his price. In other words that every man will become dishonest providing the inducement is sufficient. What constitutes a sufficient inducement seems to depend solely on the individual. We hear of graft and peculation in public office and are led to believe that the oil in Diogenes lantern would burn out in trying to find an honest man in our legislative bodies. But are public officials the only individuals that are susceptible to corrupt influence and are the rest of the populace clothed in the mantle of virtue and integrity? The question is too complex for us to attempt a general answer and we therefore confine our remarks to one specific phase and that is

DISHONEST APPLICATIONS FOR PERMITS.

the misrepresentations that are common when applications for building permits are made. It is questionable were Diogenes present when builders and owners seek the privilege of erecting structures, if he would find that the object of his quest had been discovered.

We do not want to go on record as saying that no applicant for a permit is honest. Far be it from such. There are exceptions to every rule, in this as well as other instances. But, nevertheless, it is said, and the statement seems to be the embodiment of verity, that in the majority of cases, when permits are sought, the cost of the buildings is greatly underestimated. The main object, apparently, in undervaluing a proposed building is to evade a just taxation, as it is often thought that by this ruse the board of assessors is deceived. The fallacy of this policy is evident to anyone who has given the matter serious thought. Taxes will always be more or less governed by the amount incurred in public improvements and any person who tries to unload a portion of his just share—whether it is for street, sewer, park, or other civic improvement—on his neighbor is as dishonest as anyone who practices graft or steals from the public funds. Contractors, as a rule, in underestimating the cost of buildings when applying for permits, are only victims of circumstances and do so at the owner's behest. It is said that the total each year fraudulently withheld amounts to approximately 40 per cent. Forty per cent. is a big item of dishonesty in one department of municipal government and especially so, inasmuch as a goodly portion of it evidently comes from many who are outside of the pale of politics and who believe that they are honest with their city, province and government. It is indeed a nefarious practice, to say the least, and some means should be devised making it imperative for the applicant to submit the original tenders when seeking a permit. Another phase looms up in this connection. If the actual cost of the building is recorded in every instance the grand total for the Dominion each year will blazon to the world the rapid progress and development with which Canada is meeting in her prodigious growth as one of the foremost countries in the world. So let us be honest in ourselves and help to eradicate the bad element in our bailiwick and in this we will do much in promoting an honest tendency in all matters, whether public or private.

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It is not an infrequent thing to see new structures in course of construction, and alterations in other buildings—under way, long before permits for these improvements have been issued. The practice is so obvious at times as to lead the observer to believe that the efficiency of the Building Departments in many of our important cities is not by any means up to the required standard. It seems that the incumbents of these offices are not over zealous in the prosecution of their official duties. In the first place, it is difficult to understand why cases of this kind should spring up, in view of the fact that the by-laws relating to the erection of buildings, and also to alterations in buildings, state explicitly that no work of this character shall be undertaken until the plans and specifications for the proposed improve-

ment have been fully approved by the City Architect or Building Inspector, and a permit for the same issued.

Legislation along any line of government is futile unless it is rigidly enforced, and it cannot be expected that the public will respect or conform with the laws of a department in which there is a pronounced laxity on the part of the officials in charge. If the owner or builder is allowed to proceed with construction work simply on the strength of a verbal agreement with, or an arbitrary ruling made by the head of a building department, then the time, labor, and money utilized in the enactment of by-laws represents only a foolish expenditure. A law is a law only inasmuch as it is properly enforced. If it so happens that it is too drastic, then let it be modified. If it is deficient in any respect it can be amended. But, under any circumstance, it must be lived up to faithfully. The building department of every city is too important an office to permit of a malfeasance of any kind, and the essential duties it has to perform in conjunction with substantial and well-built structures that will mark Canada's progress, cannot be over-estimated.

Apropos to this subject, it may be well to add that the clerks of the building departments cannot exercise too much care in spelling the names, and entering the proper addresses of all parties concerned, when applications for permits are made. This is imperative, inasmuch as these particulars are necessary in order to have a complete and accurate record of the business transacted by the department.

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THE report of the Royal Commission, appointed to investigate the collapse of the Quebec bridge, has been presented to the Minister of Railways, and will undoubtedly be laid before the House of Commons before this issue reaches our readers. The findings of the commission clearly show that the collapse was due not to any defect in material or construction, but to basic defect in the design.

REPORT OF QUEBEC BRIDGE COMMISSION. According to the report, the general details of construction were worked out with the greatest care and thoroughness, but in proceeding on the general formulæ now adopted as standards for bridge construction, the designers in the mass of detail seem to have lost sight of one great basic point, namely, the making of proper provision for the maximum strain on the great central span across the river. It goes to show that in an undertaking greater than ever before attempted in bridge construction it appears that the engineers failed to recognize that the usual working formulæ as to weight and strain were not applicable without considerable modification in the present instance.

That the commission makes no judicial finding as to the responsibility of the Government or of the Phoenix Bridge Company for the collapse beyond the statements outlined above, is the most disappointing feature of their report. It is hard to understand how such an engineering disaster could occur, with such an appalling loss of life with nobody to blame. Surely this great engineering mistake will not go down into history without the responsibility for the loss of some seventy lives and over four millions of dollars having been determined.

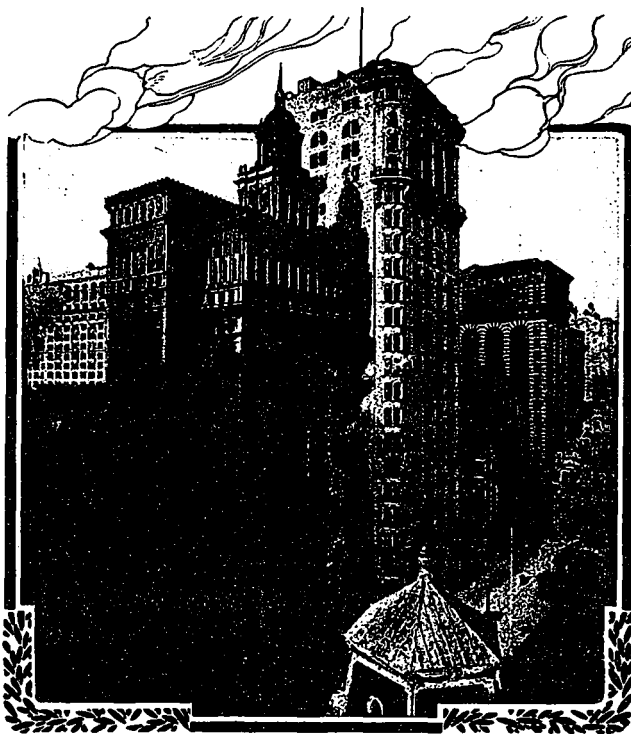
Skyscraper Construction---Good and Bad

A Review of the Interesting Discussion Created by the Sweeping Denunciation of Skyscrapers by George W. Babb, Pres. N.Y. Board of Fire Underwriters—Experts
 Maintain His Generalization is Without Sufficient Evidence. Description of Model Fireproof Office Building. Solution for Esthetic and Hygienic Problem of Tall Buildings

SPECULATION is still rife in the minds of building experts as to the exact element of danger lurking in the possibility of a great fire in the "skyscraper districts" in the larger cities on the American continent. The recent fire in the Parker building in New York (described in February CONSTRUCTION) seems to have had a tendency of increasing the intensity of uneasiness already created by the alarming statements recently made by George W. Babb, president of the New York Board of Fire Underwriters. While many eminent experts believe that Mr. Babb is right to some extent in his contentions, it seems to be the general consensus of opinion that his sweeping denunciation of skyscraper construction is unwarranted.

The discussion of this most important architectural and engineering problem should prove of especial interest to the building fraternity in Canada, in an indirect way. It is quite plain that we in Canada are following very closely the methods in building construction that have been generally adopted in the United States, but in following their methods it is most important that we profit by their experience. If the "skyscraper" is an economic success we should adopt it in our larger cities, but if it proves to be a menace to public safety and commercial welfare we should prohibit its construction in our municipal building laws. Mr. Babb, in his plea for the restriction of the height of buildings in New York City, said:

"It is not only beyond the range of possibility, but the fire underwriters fear that there is a strong probability of a fire starting in the nest of skyscrapers and beating across the streets from the windows on the top floors to other buildings. All systems of sprinklers and all attempts at fireproofing would not avail in the least in an instance of this kind, and it is only a question of time when there will be a devastating fire that will leap from skyscraper to skyscraper, hundreds of feet above the heads of the firemen. . . . Fire experience has taught us that high buildings nursed the hottest fires . . . and a loss of from one to two billion dollars will be the result."



SKYSCRAPERS IN THE WALL STREET DISTRICT OF NEW YORK CITY

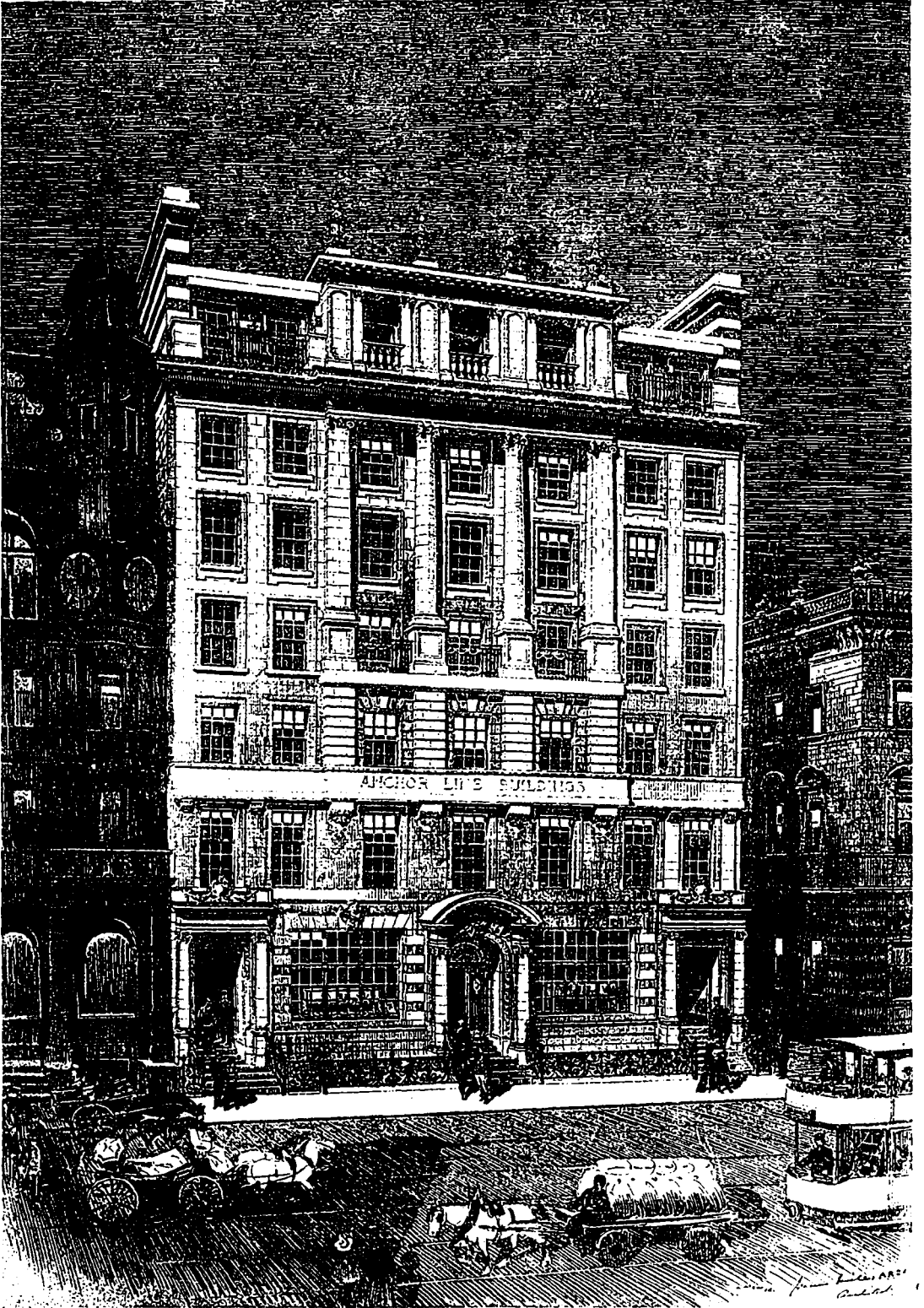
The edifice with the tower is the Gillender building, 273 feet to flagstaff; next to it on the right is the Hanover Bank building, 22 stories and 358 feet high; the low building beyond it is the Equitable Life, and beyond that is the Bank of Commerce, 20 stories. On the left of the Gillender building is the American Surety, 23 stories and 306 feet high, and next to it is the Trinity building, 21 stories and 280 feet high. The little cupola at the bottom of the picture is on the J. P. Morgan & Co. building.

This is truly an alarming statement, especially from a man in Mr. Babb's position, and it is gratifying to note that some of the greatest experts on this class of construction have most conclusively proven that Mr. Babb is an extremist in this matter, and that his generalization on the subject, as President of the Board of Fire Underwriters of New York is not wholly based upon sufficient evidence and injures by its exaggeration. On the other hand, by calling attention to the evils of any method of construction some good must come from it. The very fact that it is universally discussed shows that the evils can be corrected.

It has had another good effect, in that people have been made to think on the subject of construction and are wondering what sort of a chance they would have in case of fire in ordinary buildings since the tall skyscrapers, the best built buildings on the continent, have been declared so

dangerous. Anything that will make people stop and think a bit about what constitutes correct and incorrect building is of benefit, even though it be a foolish and needless alarm.

Some of the older structures, the skyscrapers, of New York and Chicago, of the Parker building type, were made comparatively fireproof only in so far as their structures are concerned. In all else there is little difference between them and the most ordinary building. Of course with them, as with the San Francisco and Baltimore skyscrapers, there is a possibility of grave danger. But in the newer ones, built along scientific lines, fireproof in design as well as in materials, but little damage could be done. Even in the old ones there is far greater safety than there is in the lower "ordinary" buildings, and the skyscraper districts of New York and of Chicago are about the safest places in those cities. For a very small outlay the older buildings could easily be revamped a bit, the vertical openings enclosed, windows protected, etc., etc., so that they, too, would be almost perfectly safe. These tall buildings, as a matter of fact, constitute a protection to their cities. It was the skyscrapers of Baltimore, imperfect as they were, that prevented the



New Anchor Line Building, Glasgow

James Miller, A.A.R.S.
Architect

ONE OF THE HIGHEST BUILDINGS IN THE UNITED KINGDOM AND A GOOD EXAMPLE OF THE MODERN OFFICE BUILDING OF THE OLD WORLD WHICH STANDS OUT IN STRONG CONTRAST WITH THE SIMPLE, UNIFORM DESIGN OF THE SKY-SCRAPER TYPE OF THIS CLASS OF STRUCTURE ON THE AMERICAN CONTINENT.

fire from spreading to the upper portion of the city.

TOO MUCH WOOD IN SKYSCRAPERS.

In this connection, Mr. Flagg, designer of the almost completed Singer Building in New York, in a recent interview, went on record as saying: "It is the floors and trim that burn, and the so-called fireproof wood. I think the law ought to make high building construction such that the building can never burn. The Singer Building is the highest in the world, but there is not enough wood in it to make a lead-pencil. It can never catch fire from within. The only thing to do is make the whole section in the region of skyscrapers really and truly fireproof. Tear out the wooden floors in the imitation fireproof high buildings and replace them with cement floors and replace the wooden trim with metal. The danger from the burning of the furniture is infinitesimal compared with that of the wood that goes into a building, but why not make fireproof furniture for our skyscrapers out of papier-mache or some other non-conducting material? Very handsome furniture can be made without an atom of wood in it. If wood and wood furniture were eliminated, the reasons for a great conflagration in the skyscrapers would vanish into thin air."

The Singer Building is the most perfect example in the history of skyscraper construction of the science of fireproofing tall buildings, and as such the brief description of the materials and methods used in its construction given below should prove interesting to our readers.

STRUCTURAL DETAILS OF SINGER BUILDING.

The new Singer Building is a combination of two old steel frame buildings on the corner of Broadway and Liberty St. with an adjoining new structure fronting on Broadway and extending back to the same depth as the two old lots. The old buildings, originally eleven storeys, have been raised to fourteen storeys and the new structure consists principally of a 41-storey tower with a four tier lantern which rises to a total height of 612 feet above the sidewalk. The architectural treatment of the new portion has been made to harmonize with the old, a particularly ornate design with a red facing wall trimmed with white stone window casings and cornices. The slender square tower, with its gracefully tapering cupola and tall lantern lookout, rising far above the mass of high buildings of lower Manhattan, adds a striking landmark to that already picturesque skyline.

There is a total floor space in the building of nine and a half acres, there being 20,000 square feet available on each of the fourteen floors of the main portion and 3,300 square feet on each tower floors, in no one of which are there any inside rooms. There are four elevators rising to the fourteenth floor and four more to the thirty-fifth floor, which is the last floor in the square section of the tower. Above this the curved cupola rises to the 40th floor, at which point the lantern starts. There are really 48 so-called tiers or levels of horizontal beams, this including certain mezzanine floors and the small area landings in the lantern.

The entire building is of skeleton steel construction, fireproofed with terra-cotta tiling and provided with terra-cotta floor systems surfaced with cement. The columns are founded on concrete footings sunk by compressed air caissons some 90 feet below street level to bed rock. Except in three cases these concrete footings are arranged so as to each carry a pair of columns, the load being distributed from the column through cast steel bases to a single I-beam grillage, made up in some cases of I-beams as large as 24 inches.

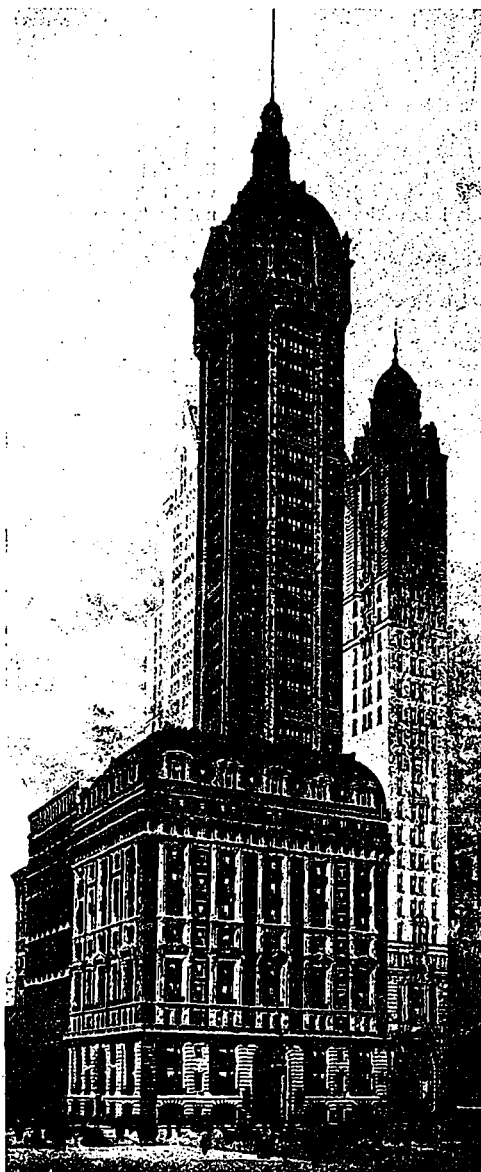
The customary practice is followed by placing the concrete footing and I-beam grillage so that the differing loads on the two columns will centre over the centre of gravity of the footing. In two of the three cases where a single column bears on a footing, small circular caissons were driven and in none of these three was an I-beam grillage used, the steel castings resting directly on the concrete.

Above the 40th floor the lantern construction is carried up with light angle columns to a smaller cupola formed with curved angle columns. A steel flag pole passes through the hole in the very top of the cupola and is anchored in a socket at the 43rd floor. (See January CONSTRUCTION.)

SYSTEM OF WIND BRACING.

The wind bracing on the tower is of extraordinary interest. On account of the small section of this tower and the necessity for as much window space as possible it was deemed inadvisable to cross-brace the entire structure or even its entire faces. The plan of the tower is divided symmetrically

into twenty-five squares each 12 feet on a side, by columns running from foundation to the cupola. The tower is wind braced and stiffened by treating each one of the corner squares as a separate tower and bracing it on all four of its sides by crossed diagonal struts. In addition



SINGER BUILDING, NEW YORK, AS IT WILL APPEAR WHEN FINISHED,—ERNEST FLAGG, ARCHITECT. THE CITY INVESTMENT BUILDING IS SHOWN AT THE RIGHT OF PICTURE. THESE STRUCTURES ARE MODELS IN ABSOLUTELY FIRE-PROOF SKYSCRAPER CONSTRUCTION.

the three closed sides of the elevator shafts are treated in a similar manner.

The exterior bracing is arranged differently on account of the necessity for openings. This consists of a long and a short panel, each cross-braced and with the horizontal members coming between floors. The windows then occur in the openings of the large panels. The bracing throughout consists of double crossed channel beams, with their flanges facing in the same direction, one of each set being cut and passing the other with a riveted plate. Above the 36th storey no wind bracing was provided.

In designing the wind bracing in this manner, that is, in assuming each of these small 12 x 12-foot towers to be independently capable of taking wind stresses, a theoretical uplift is exerted on each of the bases of the columns at the corners of the braced towers. To provide for this uplift, these columns were anchored into the concrete caissons on which they rest. All of the outside columns carry an extra dead load due to the weight of the brick walls largely exceeding the uplift from the wind and therefore no anchors were provided for them.

This system of wind bracing has proved remarkably efficient: the tower is one of the stiffest steel structures in New York City.

The steel construction is in many ways peculiar, particularly in the treatment of the wind stresses. There has never been an exactly similar solution of the problem, although it is true that there has never been precisely this same problem of a very high and slender steel tower used for office purposes.

Throughout the work it is evident that it is an architect's design in which structural detail has been subordinated to architectural considerations. This is noticeable in the trumpet arch construction at the 34th floor just below the bay windows of the upper cupola. This has the appearance of a stone arch, capable in itself of sustaining its own thrust but in reality the overhang was so great that the consulting structural engineer required a series of cantilevered beams to be built out above the arch and each voussoir to be hung from a beam by rods wedged into dog holes cut in the upper face of the stone. As the abutment of this heavy arch was originally only an 18-inch stone, the design was, at least, bold.

The Singer Building is being erected by the Singer Manufacturing Co. The architect is Mr. Ernest Flagg, to whom is due the credit for the entire design and supervision of the structure. Messrs. Boiler and Hodge are consulting engineers of the structural work.

SAFE SKYSCRAPERS A POSSIBILITY.

Thus the task of constructing the highest office building in the world with the elimination of all possible danger of damage by fire, has been accomplished, which fact conclusively proves that the danger of great conflagrations in skyscraper districts does not emanate from the fact that the skyscraper is an engineering mistake, but is due to the faulty methods and materials used in the construction of the majority of tall buildings erected some few years ago. It appears therefore that from the standpoint of safety the warning is not to cease going skyward with office buildings but to construct these tall office buildings of materials that science has given us, that will make them absolutely fireproof, such as the Singer Building unquestionably is.

SOLUTION OF ESTHETIC AND HYGIENIC PROBLEM OF SKYSCRAPERS.

In discussing the esthetic and hygienic reasons for limiting the height of office buildings, Consulting Architect F. W. Fitzpatrick, secretary of the International Association of Building Inspectors and Commissioners, offers some noteworthy suggestions in the following statement:

"Legally, I firmly believe that a man has the right to go as high as he pleases above the ground and as far

below it as he wishes, provided he does not jeopardize his neighbors' property. Then again, why should that neighbor be permitted to so build as to prevent the other man from getting the full value of his property? All rather are fine questions at law that I may be excused from discussing. The principal fault found with skyscrapers is that they make veritable chasms of the narrow streets of a city. And the community and neighbors certainly have some reason for a complaint on that score. Why not pass regulations that would secure the maximum of light, sunshine and air to the streets? Arrange it so that buildings can be carried up a certain height, six or seven stories, on narrow streets, eight or nine on wider streets on the street line, then recess or step back so many feet and go up another prescribed number of storeys on that line and then another recess and up again. Each block would then have a pyramidal form. The streets would not be "more canyons" and these different ledges would give certain esthetic uniformity to the streets and besides be of practical advantage in fighting neighboring fires."

STILL GOING HIGHER:

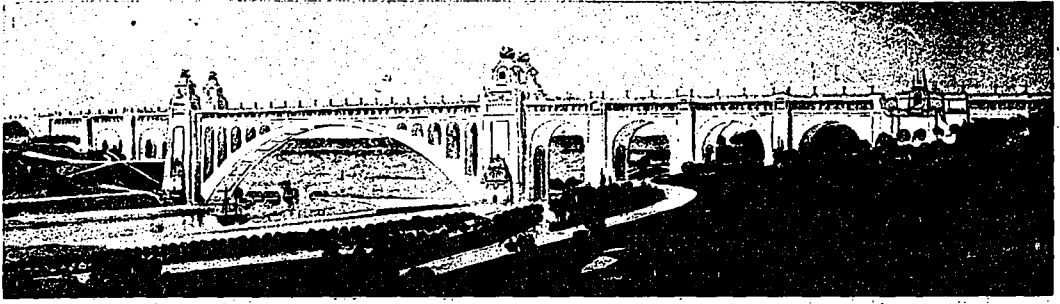
Meanwhile, the talk of pushing such skyscrapers to an even greater height than any to-day is going on. One builder of a number of the tall ones predicts the one hundred storey building on Manhattan within the life of the present generation.

Such a building would tower more than one thousand feet above the ground. The fifty storey is now being seriously considered, and its projection may be a matter of only a few years. The step from that to the seventy-five storey, and then to the one hundred storey will follow in order. The question of providing elevator service for such tall buildings has been the problem in the past, and the fire protection has not been considered a serious drawback. The weight of the cable to support the car in the thirty-storey building is enormous, and elevator men do not like to go beyond this. But the use of a new battery of elevators starting from the twentieth or thirtieth floor solves this problem. The limits of elevator service may in this way be as elastic as desired.

Let them make their buildings really and truly fire-proof, in the fullest sense of the term and provide local water supplies, and there is no reason why they should not be carried up sixty or a hundred storeys if people wish to do so.

Irish Round Towers

IT is a mistake to suppose that all the Irish round towers are of very early date, says an English writer. Many of them are contemporary with our Norman buildings. One at least was built as late as the thirteenth century. But this in no way affects the antiquity of the type. Though some of the existing towers are as late as the days of Giraldus, yet the famous passage of Giraldus about the towers would alone prove that the custom of building such towers was already ancient in his time. This argument would be equally sound, even though it could be shown that every existing example was certainly of the twelfth century or later. All that would be proved would be that the existing towers had replaced earlier ones of essentially the same type. So with the ancient churches and groups of churches there is no need to prove that many of them were built after, some long after, the invasion, Norman or English, or whatever we are to call it. But the type is none the less ancient and national. It is shown to be so all the more by the fact of its being retained in native foundations alongside of the new type introduced by the invaders. In fact, some of the arguments often employed about Irish buildings are simply another form of the old heresy about the year 1066. Discussions of Irish as well as English antiquities are often unconsciously affected by a lurking belief that after all nothing could have been done anywhere before the time of William the Conqueror.



PERSPECTIVE VIEW OF PROPOSED HENRY HUDSON MEMORIAL CONCRETE ARCH BRIDGE, AS IT WILL APPEAR WHEN COMPLETED. IT WILL HAVE A SINGLE ARCH SPAN 703 FT. IN THE CLEAR AND A RISE OF 177 FT. CENTRE TO CENTRE OR APPROXIMATELY THREE TIMES AS LONG AS THE LONGEST CONCRETE ARCH BRIDGE NOW IN EXISTENCE.

Proposed Henry Hudson Memorial Bridge

Structure to Span Spuyten Duyvil Creek, New York City, Unprecedented in the History of Concrete Arch Bridge Construction—Magnitude of Project Attracting the Attention of Engineering World

WHILE the proposed concrete bridge to be erected over Spuyten Duyvil Creek, New York City, as a memorial to the achievements of Henry Hudson, has no direct significance as far as Canada is concerned, nevertheless, this project, owing to its great magnitude, will undoubtedly prove to be of especial interest to those engaged in engineering work in the Canadian field.

Anything heretofore accomplished in concrete arch bridge construction seems to dwindle into diminutive proportions when compared to this huge undertaking. The very fact that the span of its arch is to be approximately three times as great as that of any similar structure erected up to the present day, is in itself sufficient to attract the attention of the engineering world to whom it will afford a valuable object lesson.

Canada is fast approaching that stage in her development where she will find it necessary to call upon her engineers to design and construct the many bridges which will be required to span the numerous waterways in the Dominion in order to provide adequate means of communication with which to facilitate the rapidly increasing traffic. In view of this fact, we believe that the construction of the Henry Hudson Memorial Bridge will bring to light many important structural features which should not only awaken an unusual interest in Canadian engineers, but should enable them to glean much valuable data which will be of great benefit to them in solving the many perplexing problems in bridge construction with which they will have to grapple in the near future.

MONUMENTAL IN CHARACTER.

In addition to serving as a monument of an important historical event, the bridge will connect Manhattan Island with the mainland to the north, and in this manner form a part of New York City's elaborate driveway and park system. The work of Mr. Whitney Warren, consulting architect, in developing the architectural features of the bridge is most interesting as a demonstration of what may be accomplished in architectural elaboration in concrete bridge design. The monumental character and symmetrical lines of the whole design of this proposed structure is very striking and should supply much material for interesting study by Canadian architects as well as bridge engineers.

This design employs concrete for the principal ele-

ments of the structure, the width of the span being 703 ft. in the clear. In steel, a span of this magnitude is substantially within the limits of approved construction (the upper Niagara arch, 840 ft. c. to c. of hinges, is the largest existing steel arch; the design for the Hell Gate bridge contemplates a 1,000-ft. arch). But in concrete there is nothing even remotely approaching in magnitude the proposed span. The Grunwald bridge over the Isar at Munich, Germany, 230 ft. in span, is the largest completed concrete arch. The Walnut Lane concrete arch bridge, now being built, has a slightly longer span, 233 ft. between faces of abutments. These spans become insignificant, even trivial, when compared with that now proposed for the Hudson Memorial Bridge.

A better idea of the boldness of the proposal is had from a comparison with the general field of masonry arch construction, since the problems of designs and erection for arches of stone and concrete are in a measure the same. The Cabin John arch of the Washington aqueduct, 220 ft. in span, built about half a century ago, was for a long time looked upon as an exceptional achievement, being the largest stone arch in the world. Only in the last eight years has it been exceeded, and there are now three larger spans in stone, besides the 230-ft. concrete arch at Grunwald; Adda, 230 ft.; Luxemburg, 278 ft.; and Plauen, 295 ft. In fifty years, designers have ventured only one-third beyond the limits set by the Cabin John arch, and only in three cases have they found it necessary. Now, in one leap, the present limit is to be multiplied by two and one-half.

DETAILS OF STRUCTURE.

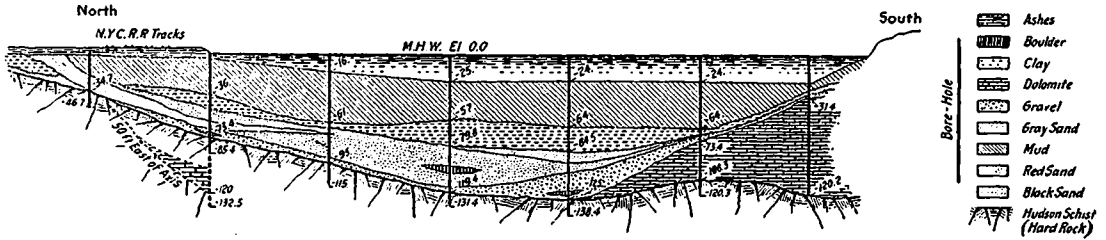
The design for this remarkable structure can be summarized very simply: The arch has open spandrels, except near the crown. The concrete ring is 725 feet in span between centres of skewbacks or 703 ft. in the clear, with a center-to-center rise of 177 ft. It is a massive concrete rib 70 ft. wide, with a crown thickness of 15 ft. and a thickness at skewbacks of 28 ft. The rib is shaped to fit the possible pressure lines so closely that tension can never occur in any part of the ring. The immense dead weight makes the influence of live-load almost negligible, and the possible effects of temperature variation, etc., are relatively small. Steel reinforcing ribs are built in, however, primarily to reduce the compressive stress on the concrete or (in another aspect) to reduce the dead weight of the structure. The steel

is uniformly distributed over the cross-section of the arch.

The arch carries a double deck. The upper or main deck is a highway floor, 80 ft. wide between railings; it has a 50-ft. roadway and two 15-ft. sidewalks. The low-

made of reinforced concrete slabs separately molded, and bolted on the top flanges of the stringers. The roadway is paved.

The approaches to the great arch are formed of a succession of 100-ft. circular arches, and involve no feat-



GEOLOGICAL FORMATION OF RIVER BED AND BANKS AT THE POINT WHERE THE BRIDGE IS TO BE ERECTED.

er deck is to carry four tracks of a rapid transit railway, but as no such line is yet in prospect the lower floor system is not to be put in place at first, but only the necessary connections provided for it. Both decks have steel framing, comprising plate-girder stringers framing into floorbeams. The floorbeams are supported in part by steel columns which foot on the steel reinforcing ribs of the arch and in part by concrete curtain walls carried up to close off the spandrel-spaces of the relieving arches (secondary arches) and the space above the main arch-ring in the crown region where the system of relieving arches is interrupted.

The posts or shafts over the main arch ring, between which the relieving arches are sprung, are each composed of a pair of concrete piers, 8 ft. thick in the direction of the length of the bridge and 22 ft. wide transversely, the two being set flush with the respective sides of the arch ring, so that a space of 26 ft. is left in the center between them. Each of these piers is hollow, however, and is a concrete pier only in appearance. It contains six steel columns (four angles latticed in square arrangement) which are each filled with concrete and then connected by a 12-in. concrete enclosing wall which forms the exterior surface of the pier. The concrete filling of each column is figured to carry its share of the load. The twelve steel columns of each pair of piers are connected at the foot by four transverse plate girders, which in turn rest upon the reinforcing ribs of the main arch, and distribute through the arch ring the load of the superstructure.

STEEL IN UPPER PORTION.

Thus, so far as concerns the portion above the main arch ring, the bridge is in effect a steel structure, partly protected by concrete and surfaced with a concrete floor. The concrete-filled posts and the relieving arches are the only exception to pure steel construction in this part to carry that part of the floor load which comes down of the bridge. The relieving arches, though they serve through the spandrel walls, are mainly mere bracing members. The bridge is a steel viaduct carried on an immense arch ring.

ures calling for special remark. The roadway on the approaches has a grade of 11-2 p.c. from either side up toward the centre; over the main span a vertical curve unites the slopes. By adopting this gradient, a notable gain in centre height of arch was secured, as compared with the first design, and the arch stresses correspondingly reduced. The 100-ft arches are of concrete, probably unreinforced. The piers between them, detailed to harmonize with the treatment of the two main piers, are faced with stone in rusticated coursing. All other surfaces of the structure are concrete. This is expected to give a marked relief between the pier faces and the arch and spandrel faces.

CONDITIONS AS TO LOADS, ETC.

The arch rib is practically a circular segment in the profile of its centre line. The centre-line radius is 450.94, except for a short distance at the crown which has a slightly greater radius, 489 ft. The other principal dimensions have already been given, but together with the governing conditions as to load, etc., they are tabulated here:

Span, c. to c. skewbacks	725 ft.
Rise, c. to c.	177 ft.
Width of ring	70 ft.
Crown thickness	15 ft.
Skewback thickness	28 ft.
Reinforcement, mean	abt. 1 3-4 p.c.
Live-load	15,000 lbs. per lin. ft.

[Roadway and sidewalks, 75 lbs. per sq. ft. on 80-ft. width; four railway tracks, 2,250 lbs. per lin. ft. each.]
 Temperature variation

Maximum shrinkage allowance 1/5000
 The estimation of dead-load, the determination of ring thickness, and the proportioning of the curve of rib, were the result of successive approximations. The influence of the live-loads in shifting the pressure line is so small that the live-load moments had very little bearing upon the ring thickness. The limiting compressive unit-stress in the concrete was the most weighty factor; the two objective points of safe maximum stresses and least combined cost of steel and concrete were attained by adjust-

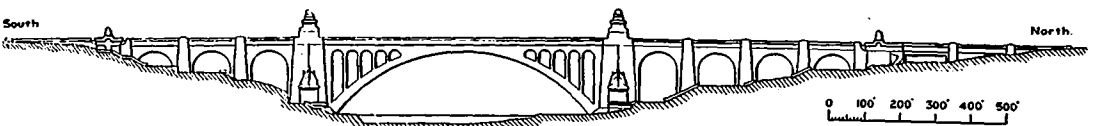


DIAGRAM GIVING SCALE OF MAIN ARCHES AND APPROACHES.

The only further details requiring mention here are the following: The relieving arches, spanning about 30 to 35 feet in the clear, have reinforced concrete rings. The deck of the roadway consists of plain concrete arches sprung between the stringers. The sidewalk floor is

ment of both the ring-thickness and the reinforcement percentage.

A concrete at least as rich as 1:2:4 was decided to be used, and for this the permissible compression, all sources of stress considered, was fixed at 750 lbs. per sq. in., the

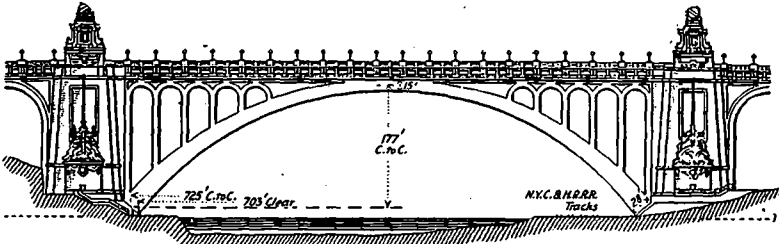
working stress allowed by the Bureau of Buildings of Manhattan Borough, New York City, for semi-looped reinforced-concrete work.

COMPUTATION OF STRESSES.

The computation of stresses was carried out on the basis of exact elastic analysis. Both a graphical and an

Skyscrapers 100 Storeys High

THAT architectural and engineering resources have by no means been fully exploited in the erection of buildings of Babylonian heights is the opinion of A. E. Yost, an architect of Los Angeles, Cal. According to this gentleman the 100-story structure is not a remote possibility, and in all likelihood will rear its majestic outlines to the gaze of many within the present generation. The completion of the Singer building make the next step the 50-story skyscraper, which will be followed by an additional 25 floors, and thence onward, or rather upward, until the celestial and dizzy altitude of the century mark has been reached. To what extent will this aerial trend continue?



DETAIL OF MAIN ARCH, SHOWING LENGTH AND HEIGHT OF SPAN.

algebraic calculation were made, being checked against each other both in the location of the several pressure lines and in the stresses.

In all the calculations, the modulus of elasticity was taken to be 1/15 that of steel; calling 30,000,000 the modulus for steel, the concrete was credited with a modulus of 2,000,000 lbs. per sq. in. Then with 750 lbs. unit-compression in the concrete, the steel reinforcement is stressed to 11,250 lbs. per sq. in. as a maximum. This figure is subject to modification, however, to allow for the fact that the steel carries its own weight, and for the unequal distribution of the shrinkage of the concrete as the construction work progresses.

Since the arch ring is never required to resist tension, the steel which is put into the ring is not strictly reinforcement. No direct static conditions to ensure structural integrity or homogeneity of the entire arch ring, and being once provided it was applied to the purpose of reducing the compressive stress in the concrete. Since the steel costs much more than concrete, a minimum amount of steel was desirable. The conflicting requirements were harmonized by successive approximations, which were begun with a crown thickness of 12 ft., and developed by repeated modification on the basis of the calculated extreme-fiber stresses and total costs. The final result is a steel percentage which will probably average about 1-3-4 p.c. The distribution of the steel to suit the variations of total arch stress, however, will make the percentage at different sections vary from about 0.6 p.c. to about 2.9 p.c. at the crown.

The weight of the steel in the arch, including columns and deck, counting a length of 750 ft., is about 12,000 tons; about 8,500 tons of this is in the arch ring. These figures are quite roughly approximate, of course. They are intended to include the weight of bracing and details, taken as 40 p.c. of the main sections. The corresponding volumes of concrete are 75,000 cu. yds., and 47,000 cu. yds., the former of which include the foundations.

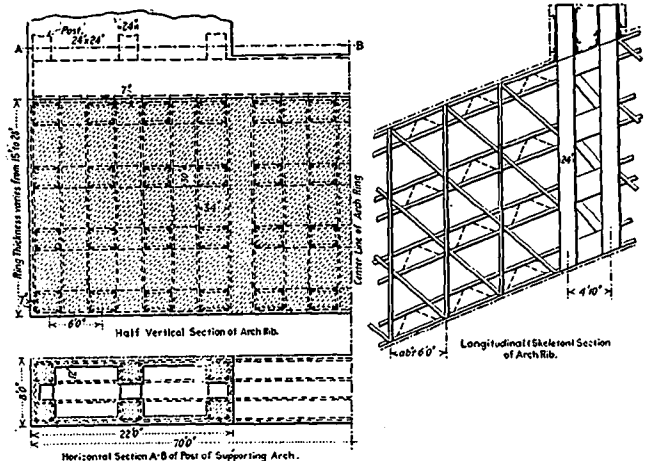
The total length of the bridge, including the approaches, is 2,840 ft. Its cost, excluding special ornamenta' features, is estimated at \$3,300,000. About one-half of this is chargeable to the large arch and its superstructure.

The design of the bridge was carried out by the organization of the Department of Bridges of the city of New York. Mr. J. W. Stevenson, commissioner of bridges; Mr. C. M. Ingersoll, chief engineer; Prof. Wm. H. Burr, consulting engineer; Mr. Whitney Warren, consulting architect, and Mr. Leon S. Moisseiff, engineer in charge.

However, Mr. Yost admits that two great obstacles will have to be overcome before this can be accomplished. These are the lack of adequate fire protection at such a height and the impossibility of providing elevator service under the present systems. Even now in thirty-story buildings the weight of the cables supporting the cars is enormous. The problem of construction, he says, will be solved by the utilization of concrete, re-inforced by steel, which has opened the way for wonderful development in the building line. With it not only fireproof, but earthquake proof, structures can be erected.

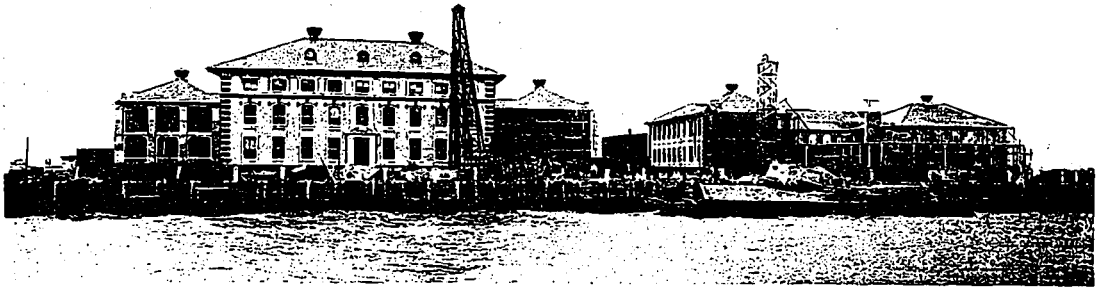
Sanitary Wall Beds

SANITARY wall beds are now promised as the latest improvement in apartment house construction. Disappearing wall beds will now give us bedroomless flats. It is claimed that flat buildings thus constructed will make two and three room suites serve the purpose of the old four or five room apartments. The bed when not in use is folded into a closet or recess, ventilated and lighted by a window or vent, creating an all-day sanitary arrangement. The bedding is securely fastened at the foot of the bed and when shut away for the day the sheets and



DETAIL OF CONCRETE WORK TO BE USED IN CONSTRUCTION OF THE ARCH.

comforters hang slightly separated, thus affording proper sanitation. When not in use the ornamental face of the bed presents to the eye a large cheval plate mirror and mantel place. When the bed is down, automatically closing doors form an apparently solid wall.



NEW HOSPITAL BUILDINGS OF U. S. IMMIGRANT STATION, ELLIS ISLAND NO. 3, NEW YORK HARBOR, THE FOUNDATIONS OF WHICH ARE EXEMPLIFICATIONS OF THE PRACTICABILITY OF CONCRETE PILES. THE BUILDINGS ARE CONSTRUCTED THROUGHOUT OF REINFORCED CONCRETE AND HOLLOW TERRA COTTA TILE.

Application of Concrete Piles

BY WALTER MUELLER

A Thorough Description of the Concrete Pile Foundation Work of the New Fireproof Hospital Buildings at the U. S. Immigrant Station, Ellis Island, New York Harbor, Showing the Advantages of Concrete Piles Over Wood Piling

[The large number of heavy structures now being erected in Canada has rendered the question of foundation piling a most important one, and the prospect of millions being spent in the next few years in wharves, breakwaters and reclamation work demands that engineers should carefully investigate every probable substitute for the wood piling with a view to securing something of a more durable and permanent nature. We publish Mr. Mueller's article, believing it to be of interest to our readers as the solution of a difficult foundation problem, in which the advantages of the concrete over the wood pile is demonstrated most clearly.—Ed.]

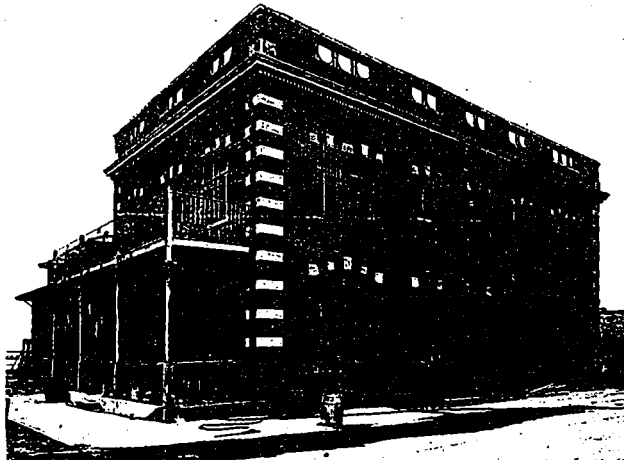
CEMENT has served to solve many engineering and constructional problems during the past decade, but it is questionable if in its more recent application any have been of greater importance to the engineering world than that of the concrete pile. The wood pile under certain conditions is most impractical, it being subject to decay and the bad effects of the elements and its use would prove fatal to the permanent success of many an engineering undertaking.

A notable instance of a case of this nature may be found in the recent construction of the United States Immigrant Station on Ellis Island in New York harbor, which occupies fill-in ground of a very soft, sticky nature. It is a question as to whether a solid, permanent foundation that would have remained sound and safe as long as the buildings stood, could have ever been constructed of wood piling. Concrete piles were used and I am safe in stating that the foundation will remain as sound and solid as it is to-day long after the building, which it supports will have yielded to the play of the elements.

One of the important departments of the station is that devoted to the treatment of sick immigrants, particularly those suffering from contagious diseases. Contagious cases are now taken care of in the hospital on the main island; but in order to secure thorough isolation, a group of hospital buildings for their exclusive treatment is now under construction on what is officially known as Island No. 3. The buildings will occupy this entire island. They will constitute an effective barrier, guarding the country in general, and New York in particular, against the introduction of diseased immigrants. As island No. 3 is connected with the main island only by a narrow footbridge, practical isolation can be effected at any time. Thus active measures can be easily taken to prevent the mingling of the sick and the well.

The entire group of buildings is being built of fireproof materials throughout, namely, reinforced concrete and hollow terra cotta tile. In addition to the utilitarian point of view, the buildings will be architecturally attractive, and when completed will considerably enhance the general appearance of the entire station. Perhaps the most interesting as well as important use to which concrete is being put in this work is in the foundations, which consist of concrete piles. This is the second instance of the application of this type of piling on Ellis Island.

By invitation a large number of architects and engineers, among



A RECENTLY COMPLETED DETENTION HOSPITAL, U. S. IMMIGRANT STATION, ELLIS ISLAND (PROPER), CONSTRUCTED ENTIRELY OF FIREPROOF MATERIALS, NAMELY, REINFORCED CONCRETE, BRICK AND HOLLOW TERRA COTTA TILE.



VIEW SHOWING TWO OF THE NEW HOSPITALS FOR CONTAGIOUS DISEASES, U. S. IMMIGRANT STATION, ELLIS ISLAND NO. 3, EACH OF WHICH RESTS ON CONCRETE PILES. A FEATURE OF THE EXTERIORS OF THESE BUILDINGS IS THE MANNER IN WHICH THE TERRA COTTA TILE HAS BEEN USED FOR TRIMMINGS AND ROOF TO RELIEVE THE DEAD GRAY COLOR OF THE CONCRETE WALLS. A CONCRETE PILE DRIVER MAY BE SEEN AT THE RIGHT.

them representatives from nearly all of the trunk line entering New York, recently visited Ellis Island to watch the placing of these piles. The keen and critical interest with which the work was followed, together with the favorable comment upon the methods employed, augurs well for a more widespread use of concrete piling.

New York particularly, with its large area of reclaimed land, affected as it is by tidal action, offers unusual opportunities for the use of concrete piles. In addition, experience has shown that the extensive construction of subways and sewers, and the deep excavations necessitated by the foundations of skyscrapers, tend largely towards draining the surrounding soil. The result is that a large amount of wood piling, originally under water, is now above water level and therefore, subject to rot, another argument in favor of an imperishable form of piling.

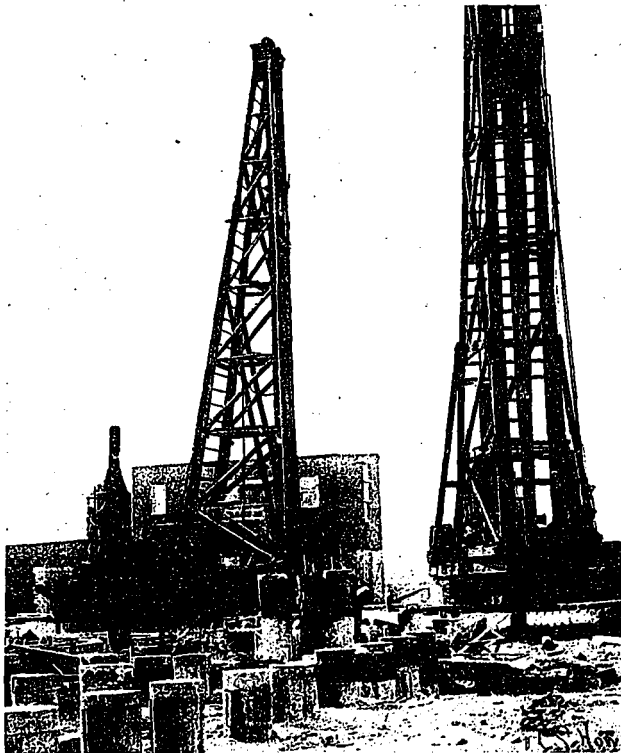
Encouraging the inspection of those naturally most interested in up-to-date building methods is a good indication of the broad-minded spirit actuating many members of the concrete industry. As to the results of a policy of this kind, the writer understands that a number of contracts for concrete piling of the type used at Ellis Island, which have lately been awarded, came as a direct result of the aforementioned invitation.

Much of the ground occupied by the immi-

grant station is of fill, very soft and sticky in its nature and largely interspersed with rock and debris from dredging. This is more particularly so in the case of Island No. 3, which is composed entirely of soil of this character. Under the circumstances, the idea of using wood piling was discarded, concrete piles being deemed more suitable in every way.

After a thorough consideration of the various types of concrete piling by the government's engineer, Frank S.

Howell, the Raymond pile was ultimately selected as meeting all requirements. This type of pile is made by placing tapering sheet steel shells in the desired location and thereupon filling them with concrete, which is carefully tamped during the operation. The shells remain in the ground permanently, and effectively protect the setting concrete against distortion through earth pressures. At Island No. 3 the earth pressure is particularly severe on account of the filled ground, the tendency of the soil being to slip towards the middle of the island, where many of the 1,200 piles have already been placed. Obviously, any concrete pile made in place without the protection of a permanent form would stand but a small chance of retaining its specified shape in soil of this character.



PILE DRIVERS EMPLOYED IN PLACING CONCRETE PILES AT ELLIS ISLAND. THE PILE DRIVER TO THE RIGHT SHOWS THE CORE AND SHELL READY FOR PLACING. A NUMBER OF COMPLETED PILES ARE SHOWN IN THE IMMEDIATE FOREGROUND.

The shells, which are of 20 gauge sheet steel, 16 gauge at the boot or point, are placed in the

ground by means of an iron driving core, propelled by a 3,000 pound Vulcan steam hammer falling three feet and delivering 10 blows for the final inch of penetration. The core consists of two cones, which can be separated or brought together through the action of a series of wedges. A driving cap is attached to the head of the core. The shells, which are made in sections, are slipped over the core, the cones of which are now separated, until it is entirely encased or dressed. It is thereupon driven into the ground to the proper depth and then withdrawn by bringing the cones together, or collapsing the core as the operation is termed. The shell thus deposited in the ground, is filled with concrete, after having been carefully and thoroughly inspected by means of an electric light lowered into it.

The favorable results secured with concrete piling as foundations for the corridor of one of the hospitals on the main island, as well as for the academic group of buildings at the U. S. Naval Academy, Annapolis, were influencing factors in the selection. In the latter instance, a saving of more than fifty per cent. over the cost of the wood piling originally specified was effected.

The increased bearing value claimed for piles of tapering shape is being fully substantiated at Ellis Island. In most soils large, tapering concrete piles, 18 or 20 inches in diameter at the top, and 6 or 8 inches at the point are very much more effective than straight wood piles of greater length. This is particularly true where a comparatively hard stratum is underlaid by softer material, as is the case in the operations described herein.

In New York city, 25 ft. tapering piles have been found to be equal to 40 ft. piles of a uniform diameter. At Salem, Mass., 20 ft. piles of the same size were found to be equal to 50 and 60 ft. wooden piles, which, while large, were nearly straight. At Boston, a pile 20 ft. in length, 20 inches in diameter at the top and 6 inches at the bottom, while requiring fewer driving blows, offered more final resistance than a wood pile of the same length, 18 inches at the top and 13 inches at the point.

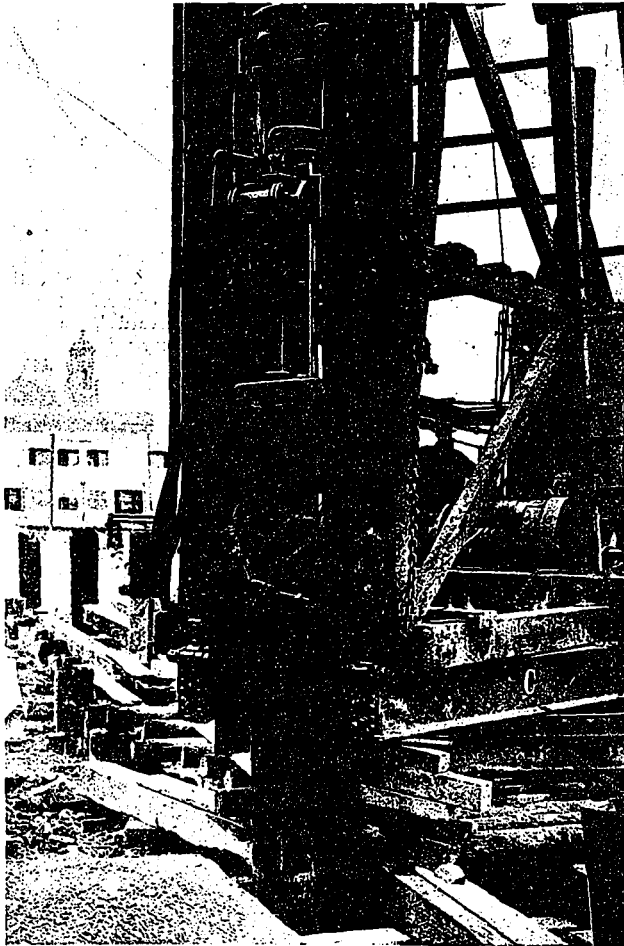
The explanation is that a tapered pile distributes its load more uniformly throughout its entire length. In a straight pile, on the other hand, the load is largely concentrated upon the limited area of the point. Thus, where a pile penetrates the hard stratum lying near the surface

and into the softer underlying material, the bearing value of the upper stratum is fully developed by the large, tapering wedge-shaped type of pile. This bearing value would be almost lost, however, with a pile which is straight, or nearly so.

An unusual feature of the construction and one which is attracting considerable attention on account of its novelty and economy, consists in the floor and foundation girders of the superstructures of the buildings being built 2, 3 and 4 feet above ground. In place of the usual brick piers or columns, the concrete piles, instead of being cut off flush with the ground, as is the usual practice, are run up to the desired height. The concrete girders are built directly upon them. This feature eliminates all excavation and cuts down the concrete to the girders over the tops of the piles. The piles used in this manner are reinforced with round rods.

The increasing use of concrete piles brings up the question as to how they compare in cost with wood piles, upon whose domain they are encroaching to a constant increasing extent. One of the chief factors making towards the increased cost of wood piles is their growing scarcity. This is largely due to the recklessness with which our forests are being yearly depleted. The cost of concrete piles as compared to that of wood piles, was brought out in a striking manner during the erection of the new buildings of the United States Naval Academy at Annapolis, Maryland. The original plans called for wood piles, but as the allotment made for the various buildings had been exceeded, it was found necessary to reduce costs wherever possible. Calculations showed that by using concrete piles a saving of over \$27,000, or more than 50 per cent. of the cost of wood piles could be effected. As a result, these piles were selected. The various factors which

tended toward the economy resulting from the substitution of concrete piles are thus stated by Walter R. Harper, inspector in charge of the work: 2,193 wood piles were replaced by 835 concrete piles; 4,543 yards of excavation were reduced to 1,038 yards, saving 2,504 yards; and 3,250 yards of concrete footing were reduced to 986 yards, thus saving 2,264 yards. Shoring and pumping, which would have cost \$4,000 had wood piles been used, were entirely eliminated. This indicates, in a measure, the means by which foundation costs were reduced as stated.



THE SHELL OF A CONCRETE PILE DRIVEN TO REFUSAL BY A 3,000 POUND STEAM HAMMER FALLING THREE FEET AND DELIVERING TEN BLOWS FOR THE FINAL INCH OF PENETRATION. THE DRIVING CONE IS ABOUT TO BE WITHDRAWN.



A JOURNAL FOR THE BUILDING AND
ENGINEERING INTERESTS OF CANADA

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CORRESPONDENCE.—The Editor will be pleased to receive communica-
tions upon subjects of interest to the readers of this Journal.

Vol. 1 March, 1908 No. 5

Current Topics

AN output of between 30,000 and 40,000 barrels of
cement per month is the estimate of the National
Portland Cement Company for the year 1908, as a result
of having come into possession during the past year of
175 acres of marl deposits near Hanover, Ont.

AT the fourth annual meeting of the Western Ontario
Brickmakers' Association, held February 19, at
Blenheim, Ont., the following officers were elected for the
ensuing year: President, Adolphus Wehlan, Rodney;
first vice-president, J. E. Minor, Kingsville; second vice-
president, A. W. Hill, Essex; secretary-treasurer, Alfred
Wehlan, Cairo.

THE personnel of officers of the Province of Quebec
Association of Architects for the ensuing year is
as follows: President, D. A. Brown, Montreal; first vice-
president, L. A. Ames, Montreal; second vice-presi-
dent, G. Emond, Quebec; secretary, B. A. Vanier, Mon-
treal; treasurer, J. R. Gardner, Montreal; Council, R. P.
Lemay, W. X. Maxwell, P. A. Ross, L. Lemieux and
Jos. Gunner.

THE Soudan Government Railway System has recent-
ly contracted for a bridge across the Nile at Khar-
toum, the order being placed with the Cleveland Bridge &
Engineering Co., Limited, of Darlington, Eng. It will
consist of seven fixed river spans, each 218 1-2 feet long,
and one rolling span of 111 feet 9 inches, making a length
over the waterway of 1,641 feet 3 inches. In addition
there will be four short approach spans. It will carry
two 3 feet 6-inch gauge railway tracks, a roadway and a
11-foot footwalk, the latter carried on brackets outside the
trusses, which are to be 38 feet 3 inches apart. The trusses
will be carried on steel cylinders, 16 feet in diameter at the
cutting edges reaching a depth of 60 feet below the water
level.

ASPIRE that was unique in church architecture has
just been torn down at Providence, R.I., in the
razing of the Jefferson street Baptist church, which was
entirely of brick, even to the apex, each brick being
especially fashioned for the place it occupied.

CHICAGO is planning to build the biggest hotel in the
world. This is the new La Salle Hotel, to be erected at
La Salle and Madison streets. With the furnishings, the
hotel will represent an investment of approximately £700,-
000, and with the land, which was leased on the basis of
a value of £500,000, total will run up to £1,200,000. The
building will be twenty-two storeys high, with a basement
and sub-basement, and will have 1,172 rooms.

THIS simple method of driving spikes under water
may be useful to contractors. For this purpose a
piece of iron pipe, large enough to hold the spike loosely
drift slightly longer than the pipe is placed in the pipe
and used to transmit the hammer blows to the spike. The
length of pipe used will depend on the depth of water and
the drift should be of sufficient length to permit a hand-
hold above the pipe. By means of this expedient spikes
can be driven in several feet of water and at any angle
desired, as the spike will necessarily be driven at the angle
at which the pipe is held.

MR. S. HEARST SEAGER, of New Zealand, at a
recent meeting of the Royal Institute of British
Architects, in a paper read before that body, made several
valuable suggestions regarding theatre safety exits.
He suggested that a law should be passed making it com-
pulsory for all theatres to use their fire exits at least
once a week. In his opinion these exits should be of a
uniform width from the auditorium to the street, and at
any change in the line of direction the walls should be
sheathed with perfectly smooth sheet iron suitably curved
so as to eliminate the possibility of a jam occurring.

ASTRIKING example of the strength, durability
and permanence of cement concrete is found in
the Pantheon at Rome, which was constructed by
Agrippa in the year 27 B.C., nearly 2,000 years ago.
This great structure was built in a circular shape, having
walls about 20 feet in thickness. The roof is hemispheri-
cal or dome-shaped, and was also constructed of cement
concrete. It has a 30-foot opening in the top, and spans
over all 142 feet 6 inches across. This structure has
withstood the storms and destructive elements of 19 cen-
turies, and does not show a single sign of decay or break-
ing of any description. The concrete used at that time was
a combination of slaked lime, volcanic dust and broken
stone, a combination this is regarded as being inferior to
the concrete of to-day made from Portland cement.

MR. T. W. SOTHAM, chief engineer of the Hydro-
Electric Power Commission, advances a new use
for Niagara power in cities, towns and municipalities.
He states that by the installation of suitable electric con-
nections throughout the city or municipality, as the case
may be, a portable electric fire pump, drawn by horses
in the usual way, could be instantly set in operation, and
would have the additional advantage that it would not be
necessary to wait for sufficient steam pressure, as is the
case with fire engines. Mr. Sotham gives it as his opin-
ion that electric pump of ample capacity could be pro-
cured for one-tenth the cost of a steam fire engine of the
same pumping capacity, and by its use a pressure of 300
pounds to the square inch could be instantly created and
maintained.

THE Board of Trade of St. Catharines, Ont., is endeavoring to make the deepening and enlargement of the Welland Canal, in preference to the Trent Valley canal project, a live issue. A resolution is to be prepared, and sent around to the various boards of trade for their sanction, and then a memorial on the subject will be drawn up and presented to the Dominion Government.

* * *

AN enormous steel plant to cost \$6,000,000 will be erected at Hankow, China, by a company of Chinese capitalists, primarily for the purpose of supplying steel construction for various railroads in Central and Northern China. It is believed that the plant will become a factor in the general steel trade of the far East. New steel plants are also projected in Japan and India. The cost of the three plants will be in excess of \$25,000,000.

* * *

AN important three-year agreement between the stonemasons, the bricklayers and their employers of Toronto has been ratified whereby all parties are bound to maintain until May 1, 1911, the present rate of wages, 50 cents an hour, and an eight-hour day. A noteworthy clause inserted in the agreement is that the two unions refrain from entering into any sympathetic strike in case of trouble with the members of any other union.

* * *

THE Board of Management of Knox College, Toronto, has decided to limit the competition for the preparation of plans for the new \$400,000 building it will erect to architects who are bona fide residents of Canada and follow their profession in the Dominion. The architect whose plans are accepted will have charge of the erection of the new building, and will be paid the usual fees for the work. There will be substantial money awards for the second, third and fourth best plans submitted.

* * *

A STRONG demand for manufactured products has brought about a resumption of operations in many lines of industry and this has given people a much more hopeful feeling. A large number of concerns have resumed operations upon comparatively the same basis as before the stringency, while others have made a beginning and will add to their force from time to time until it is back to the former level. It is believed that building will continue upon practically the same scale of activity as heretofore. It has been suggested in some cities that there will be an advance in rents due to the small amount of construction in certain classes of building during 1907.

* * *

WHILE the cheap concrete house or cottage is still the subject of theoretical discussion in this country and abroad, the practical employer in America is going ahead with their construction owing to his conviction that they are an economical investment. In Colorado the American Smelting and Refining Company has started a new town near Trinidad and contracted for the erection of eighty houses to cost \$500,000. Every building in the town will be of concrete. The only wood to be used will be on the roofs and the inside fittings. It is the aim of the company to prevent the degeneration of the coal camp into a shanty town. All of the land for public grounds has been bought and foreign workmen will be prevented from burrowing in the hillsides or building tin can houses. The Dupont Powder Company is to build a town and factory twenty miles south of Denver.

CHINESE papers are filled with the rumor that Peking is to have modern waterworks. According to these reports the Portuguese minister is said to be making strenuous efforts to have the contract for installing the works awarded to a Portuguese firm.

* * *

THE Connecticut avenue bridge, spanning the deep gorge of Rock Creek, has just been completed at Washington, D.C. It is built entirely of concrete, no reinforcement of steel being used throughout the structure. In length it measures 1,421 feet, and it has a 52-foot roadway with walks on either side. The floor of the bridge, which is 186 feet above the ground, is supported by a series of 150-foot arches and two narrower ones of 86 feet each. The structure cost \$1,000,000, and was several years in course of construction.

* * *

THE county commissioners of Pueblo county, Colorado, have decided to take out all the wooden bridges in the county and replace them with reinforced concrete and cement structures. The commissioners reached this decision after an inspection of all the bridges and culverts in the county. They believe that the new and more substantial structures can be erected at practically the same price as was paid for putting in wooden bridges, and that they will not only be better and safer, but their installation will do away with the great amount of repair work that has been necessary on the structures that are in service now and which have been used for a number of years.

* * *

IN the construction of dams for Huronian Company's power development in Canada a large part of the concrete work in dams, and also in power house foundations, was done in winter, with the temperature varying from a few degrees of frost to 15 degrees below zero, and on several occasions much lower. No difficulty was found in securing good concrete work, the only precaution taken being to heat the mixing water by turning a 3/4-inch steam pipe into the water barrel supplying the mixer, and, during the process of mixing, to use a jet of live steam in the mixer, keeping the cylinder closed by wooden coverings during the process of mixing. No attempt was made to heat sand or stone. In all the winter work care was taken to use only cement which would attain its initial set in not more than 65 minutes.—Engineering, London.

* * *

MONTREAL'S new fire station, No. 5, recently completed is the most costly structure of its kind in that city, having been erected at an expense of \$53,000. Ever since the building was proposed several years ago the progress of its construction has been impeded at various stages, owing principally to the unwillingness of the Finance Committee to appropriate sufficient money to enable the Fire and Light Committee to proceed with the work in an uninterrupted manner. Even after the original contracts had been awarded, it was found impossible to allow the contractors to carry on the work, as all the available funds of the fire committee for this purpose had been exhausted. Then the price of steel and other materials advanced, necessitating the procuring of an additional appropriation and the entering into of fresh contracts. However, despite these adverse circumstances the actual cost of the building itself is within the first estimate submitted by the architect, Mr. Dunlop. An extensive fire alarm system costing \$54,000, which is to be installed, will bring the cost of the building and its equipment up to the sum of approximately \$108,000. Notwithstanding this vast expenditure, the apartment in which the fire alarm telegraph service is to be located, will not be entirely of fireproof construction.

A RICH deposit of asbestos has been discovered on the farm of Harlowe Hawke, about four miles from the village of Melbourne, a place near Richmond, Que. Mining experts, who have examined the property and submitted samples of the mineral to test, pronounce it as one of the richest finds in the townships for some time. The vein, a large one, comes to the surface, and is thought to be a continuation of the one that has for several years been successfully worked near Danville.

* * *

A 14,000 horse-power plant operated by tidal energy is to be established on the south bank of the Elbe, near Cuxhaven, Germany. This is by far the most ambitious project of its character which has ever been contemplated. Electrical energy is to be delivered to the town named for various commercial purposes, but the greater part of the product of this power plant is to be made use of by factories, which are to be established in the vicinity. Hamburg capital is mostly interested in the scheme.

* * *

TO float vessels over the Alps is the latest engineering marvel projected in Europe. Signor Caminada, an eminent engineer, proposes to connect Lake Constance with Genoa by a canal built on an entirely new plan, which will enable boats to cross the Alps.

Instead of the usual system of locks by which canals are raised to higher levels, the trans-Alpines canal will be constructed on the apparently impossible basis of inclined "tubes." There will be a double line of tubular canals ten miles long and divided by lock-gates into 137 sections.

The water will descend through both canals, but will cross to each alternately, so that while a boat descends with the sinking water in one section of one "tube," another vessel will rise with the rising water in a lower section. These inclined canals will be constructed of masonry, and the gates will be of iron.

The highest point of the waterway will be at Iso'ata, in the Splügen pass, where it will rise to about 3,099 feet.

* * *

A RECENT editorial in the *Evening Telegram*, Toronto, entitled "Toronto Takes Chances" presents the problem of unsafe buildings in an interesting manner, which should cause the lay public to think a bit. It says:

"May Toronto's system of exits from public buildings in case of fire never be subjected to the supreme and awful test of a holocaust.

If Toronto's indifference to the possible sacrifice of human life were visited by the awful consequences that have followed similar indifference in other communities, the City Council would be execrated and the city architect would be prosecuted.

"Whereas the blame should rest upon the shoulders of a people who have unanimously failed to develop a public opinion that puts a proper value on human life.

"What can a city council do or a city architect do in a community which believes in taking chances on the supreme issue of life and death?

"It is a question whether public opinion has armed the civic authorities with power to exclude large assemblies from halls or rooms unapproached by wide and numerous stairways and ill-equipped with fire escapes.

"If the authorities have such power in theory, there is no public opinion that demands its exercise in practice.

It is just such editorials in the daily press that will create public opinion that will strengthen the hands of civic authorities. Public opinion is molded by the press, therefore some responsibility for this indifference rests with our daily papers.

A SLATE-BEARING property covering an area of six hundred and twenty-five acres, producing a tough, durable slate that ranks with the best in the Welsh mines, is now being developed by the Pacific Slate Company of Victoria. While slate-mines are a new industry for the Dominion, it is claimed that this deposit, which has just been opened up, is the largest of its kind in the world. The test shows the slate to be far superior to that produced in Pennsylvania and Vermont. One sign of its toughness and purity is that it can be slit into twenty-four pieces to an inch in thickness. The grade of the slate is known as unfading blue black, a quality well suited to roofing purposes. The property is situated on Jervis Inlet, about eighty miles north of Victoria.

* * *

A RECENT illustration of the growing confidence in the permanency of concrete construction is evidenced by a decision of the Streets, Walks and Drives Committee of the City Council of Atlantic City, New Jersey, to re-construct a large portion of the famous Boardwalk, using concrete piles connected by concrete girders. The portion of the walk which is to be reconstructed, extends from Connecticut to Pacific Avenue, and is located between 300 and 500 feet nearer the ocean than the site of the present walk. The change of position is necessitated by the building up of the land, which has taken place during the past four or five years. It is the intention of the city officials to replace the present wooden boardwalk as occasion demands, with a structure of a permanent nature.

Contract, as awarded, calls for 800 feet of a walk, 41 feet wide and 2,400 feet of walk, 21 feet wide. The walk is supported on 380 concrete piles, 16 inches in diameter, varying from 28 feet to 32 feet in length. These piles are arranged in bents of four and two; 20 feet from centre to centre of bent. The tops of the piles are connected by a reinforced concrete girder, 24 inches in depth and 8 1-2 inches wide. These girders form a support for the 14 x 4 inches joists.

The upper surface of the walk is faced with 2-inch plank, thus retaining to a certain extent the appearance of the former boardwalk.

* * *

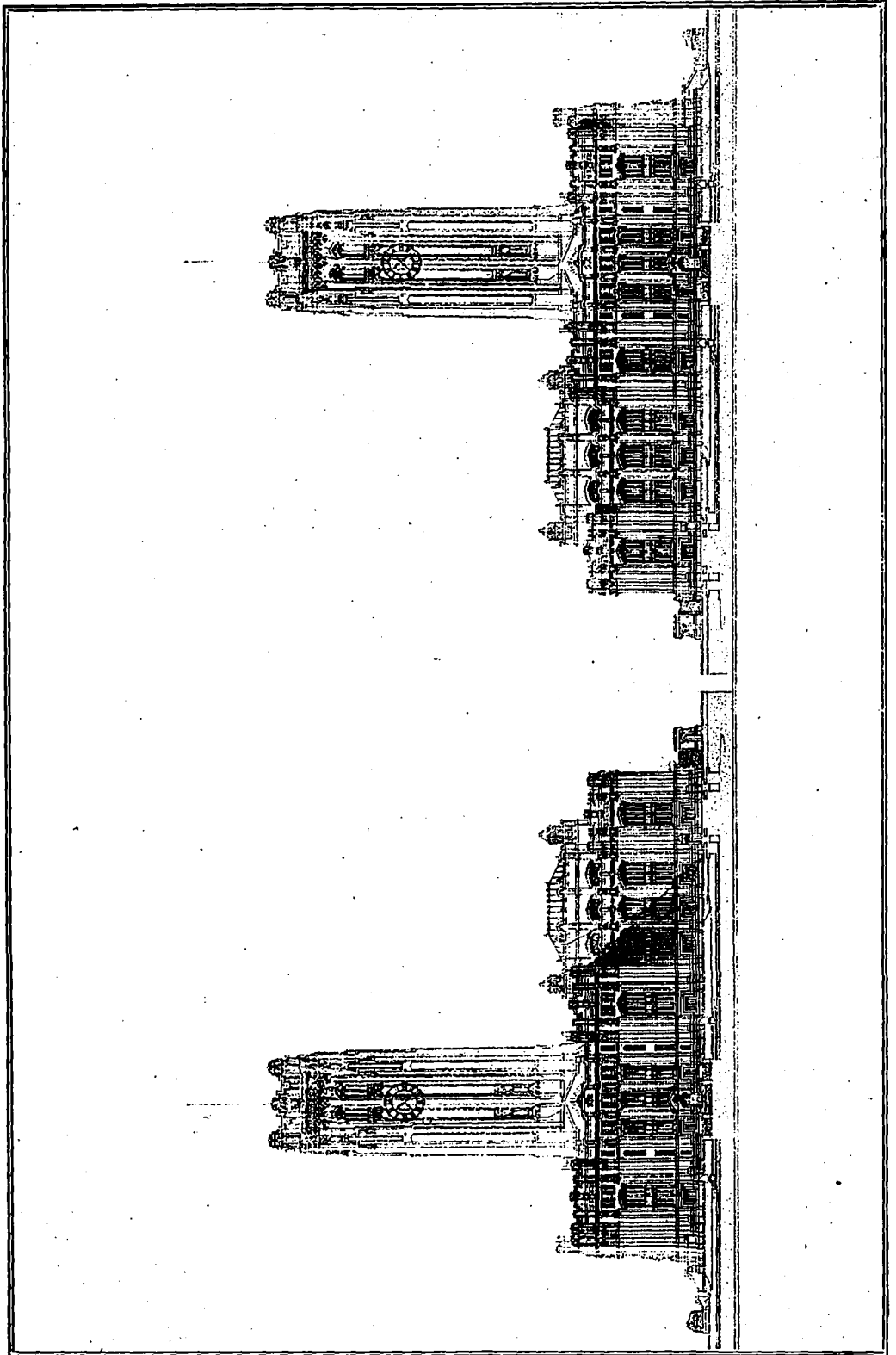
THE highest fire in the annals of New York city, and probably in the history of human habitation, occurred recently on the fortieth floor of the almost completed Singer building. The fire is noteworthy, not only for its peculiar origination and spectacular feature, but more particularly so, as it demonstrates the importance and advantages of the use of fireproof materials in the construction of modern skyscrapers.

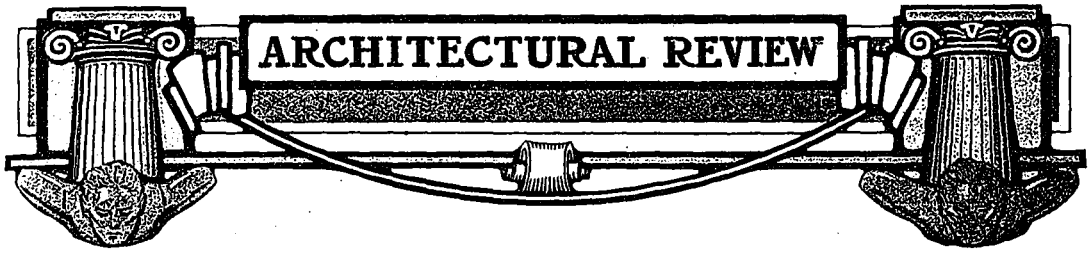
A plumber's furnace, about four feet in diameter and filled with blazing charcoal, was caught in a gust of wind, after it had been left by a workman on the ledge surrounding the cupola.

It is presumed that the wind was so strong that it moved the big pot, and in an instant a shower of sparks shot upward and sputtered against the tower's sides. Around and around swept the blazing embers, some being flung high into the air, others, rounding a corner where the gusts could not reach them, flared up brightly.

It took the elements only a few seconds to hammer pieces of the red-hot fuel against the walls and reduce them to myriads of sparks. Standing out in relief against the darkening sky was the cupola around which the flames could be seen circling the concrete and steel walls as the winds shifted. A few members of the police and fire departments ascended in the elevator and extinguished the flames with the aid of three portable chemical tanks.

An engine at the fire would have been useless, as the streams it might throw would have struck sections of the structure far below where the charcoal was blazing. However, everything the fire could possibly reach in and on the building is made of steel, iron or concrete, and no material on which the flames could feed was near by.





Gothic Design in Regina Competition

A Masterly Piece of Work in Modernized Gothic as Submitted by Architect Cass Gilbert of New York in the Recent Saskatchewan Executive and Legislature Building Competition Illustrated and Described—Designer's Description Particularly Interesting

THE design of Architect Cass Gilbert, of New York city, submitted in the recent competition for the proposed Legislative and Executive building to be erected at Regina by the Saskatchewan Government, is, to say the least, a splendid example of modernized Gothic, a style of architecture well adapted to meet the requirements of buildings of this character. Mr. Gilbert enjoys an enviable reputation as a specialist in large government buildings, two of his most notable structures being the Minnesota State Capitol and the new Customs House in New York city. In the designs of these buildings, as in much of his best work, Mr. Gilbert has displayed a wonderful versatility, a quality which is further recognized in the masterly treatment of the Gothic in this design of the proposed Saskatchewan Capitol. We publish herewith illustrations showing the various elevations, typical floor plans and landscape effect together with Mr. Gilbert's description of the whole as submitted to the Board of Awards of the Saskatchewan Government. In this manner, a most comprehensive outline of the proposed structure as designed by Mr. Gilbert can be obtained, and it is particularly interesting in every respect.

In considering the design of this proposed building the fact that it is to be erected within a province of the British Empire has been regarded as of paramount weight. It is perhaps unnecessary to point out that the tradition of Gothic architecture is inherent in the Anglo-Saxon race and is the natural form of expression of the British Empire and its provinces.

ADAPTIBILITY OF GOTHIC DESIGN.

Sir Charles Barry recognized this in designing the Parliament Building in London, and in that great structure established a type which has been followed to a greater or less degree in many of the most important buildings of the Empire. However much individuals may differ as to the merits of the detail of Sir Charles Barry's great work, it must be conceded that it forms one of the noblest monuments of modern times. It is therefore felt that both by tradition and by usage the Provincial Government would make no mistake in adopting the Gothic style for its legislative and executive building. Moreover, this style is so pliable that it lends itself readily to the varying sub-divisions of space required by the practical needs of the structure and to the various conditions of usage. It is so adapted to climatic and labor conditions of the province, and it offers itself such opportunities for beautiful and imposing architectural effects that it is logically the style in which this building should be erected. It appears, also, that as the building is to be placed on a site surrounded by a vast level plain the landscape conditions are analogous to those found in the eastern section of England, where Ely, Peterborough and other great structures lift their lofty towers above a not

widely dissimilar landscape. In the architecture of Flanders such towers as those at Bruges, Malines and Ghent, are imposing features of the wide expanse of level country. In short, as Victoria tower rises above the Parliament Buildings, so a tower would form the traditional and proper feature of this Gothic structure. A tower has, therefore, been adopted in preference to a dome, and while it is impossible within the short period of a competition to fully develop such a design in all its details, it is believed that it can be accomplished in such a way as to convey an impression of majesty, power and beauty, and leave no question of its secular and governmental purpose. The tower being in the center of the building, like the central towers of Canterbury, Lincoln, Wells and other cathedral towers, rises to a considerable height. Its lower portion being concealed in the rear view by the surrounding structure, is purposely left plain and simple, and allowance is made for the fore-shortening. While from a short distance its whole shaft would be seen rising above the building and grouped around its base, the architecture is so devised as to *lift with* the tower, and to "compose" with its silhouette, while the tower from the distance would be a great landmark.

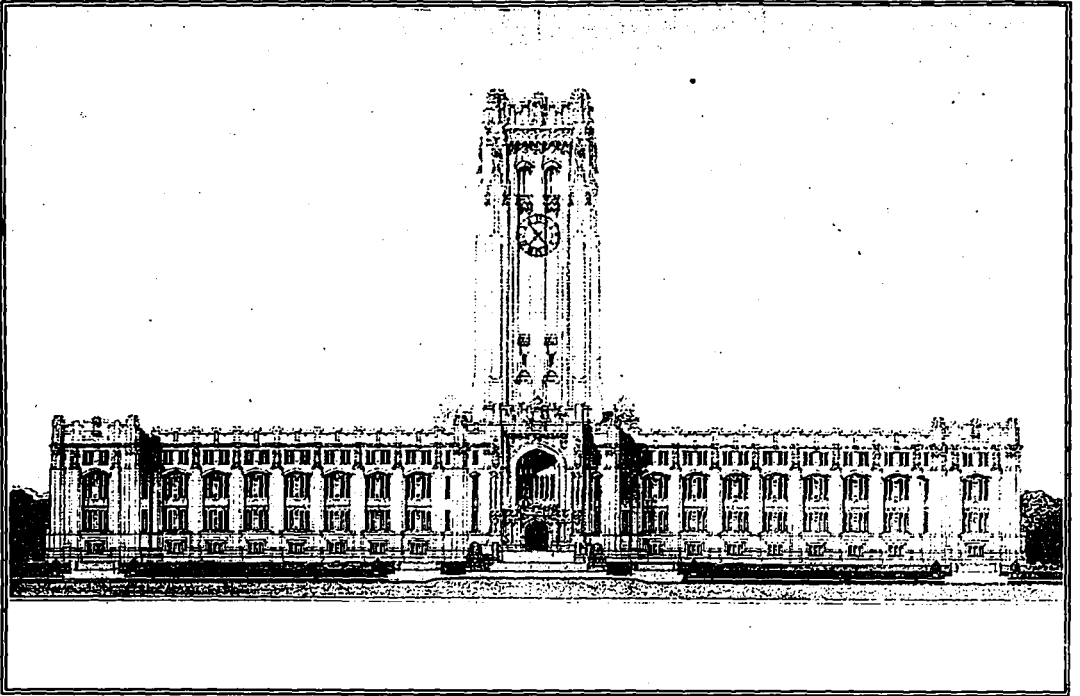
It is probable that further study of the design would simplify many of its details, which should express strength and vigor rather than delicacy and over-refinement.

As to the general treatment of the facades, the modern necessity of ample light and many recurring openings of similar dimensions make for elaboration of detail, but this would be simplified in execution so far as possible, and it is, in fact, very difficult to show upon small scale drawings any indication of form without apparent elaboration.

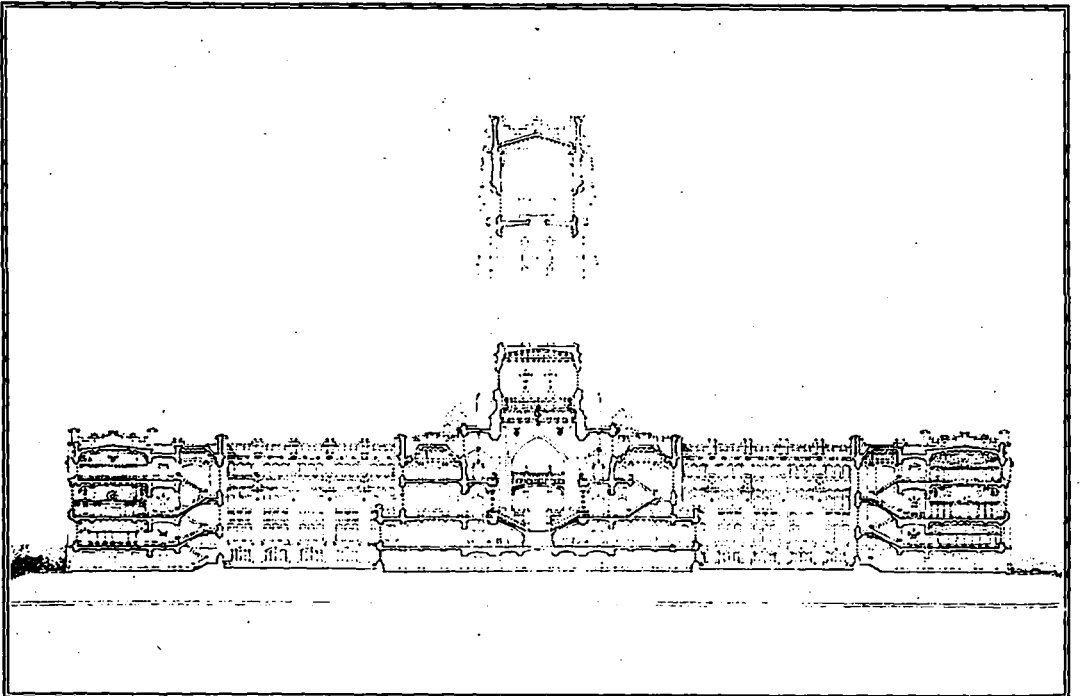
If, as suggested later, the material known in Toronto as Roman stone is used, which is also being used at the West Point Military Academy in the United States, under the name of concrete stone, the reproductive character of the design, where many parts are repeated again and again, would minimize the expense, though, of course, even in this material salient points would be cut by hand. It is impossible to give the charming quality of hand cut work to any machine material, and only the limitation of expense justifies the suggestion.

Foliated ornament is avoided, excepting in a few focal points.

While the building is designed to meet the conditions of pale buff limestone trimmings and red brick, it is hoped that the local Canadian buff limestone can be used throughout, and if so, that it can have the somewhat rude and artistic character as appears in the Gothic buildings of the early part of the 14th century in England. If, however, limestone is found too expensive, an admirable and permanent substitute is found in the above named



FRONT ELEVATION OF COMPETITIVE DESIGN FOR LEGISLATIVE AND EXECUTIVE BUILDING AT REGINA, SASK.—CASS GILBERT, ARCHITECT.



SECTIONAL ELEVATION OF COMPETITIVE DESIGN FOR LEGISLATIVE AND EXECUTIVE BUILDING AT REGINA, SASK.—CASS GILBERT, ARCHITECT.

Roman stone, which, when slightly tooled, produces an excellent effect.

No galvanized iron ornament would be used in any part of the building. No imitation marble would be used; no sham of any kind permitted. In short, each material would be exactly what it purports to be, and not an imitation of some other material.

DESCRIPTION OF GROUNDS.

The building faces north (toward the city of Regina), and hence the main development of the site naturally extends toward the city. The practical entrance to the grounds will, however, undoubtedly be by the way of Albert street, and in planning the development of the grounds two main roadways are projected from Albert street, one beginning at, or very near, the bridge, and the other at a line just north of the building itself.

It is understood that the development of the grounds, terraces and roadways, is not intended to be included within the cost of the building itself, but that it was the intention of the promoters that the drawings should indicate the landscape design and provide for the location of future extensions of the building. Such future extensions are suggested by the dotted lines on the block plan, and as will be seen thereby there remains ample space both to the north and south of the extensions indicated to provide other structures in the distant future, as the needs of the Government may require.

As the main axis of the building is opposite Smith street, the suggestion is made of re-echoing the main approach on the opposite side of Wascana Lake and of placing some low park structures, or shelters, grouped around an important statue or monument, so that looking from the building an interesting termination to the vista would be obtained, and from the park on the north side of the lake a fine view of the building would be had.

Upon both sides of the lake there would be well developed landing places, as suggested on the plan of the park accompanying the programme.

In designing the landscape gardening it has been thought undesirable to include fountains as a feature, for climatic reasons, and it has also been thought desirable to plan the grounds so that upon the main axis, and immediately surrounding the building, the lines shall be formal and conventional, in harmony with the serious and dignified purpose of the building, as is usual in the setting of many of the important buildings in England, while the more remote portions of the park should be less formal and more in the manner of what the continentals call the "Jardin d'Anglais."

THE BUILDING PLAN.

The plan of the structure is symmetrical, and in assigning the space it is obvious that the apartments of the principal officers of the Government may be placed either in the east or in the west wing. For some reasons it might be desirable that the governor, the premier and the council chamber, should be placed at the west end of the building nearest Albert street, and this can be done by reversing the location without in any way changing the design, their placing, in short, being merely a question of assignment of space.

The plan shows these principal offices located in the east wing, overlooking Wascana Lake, partly for the reason that it is probable that this outlook would be the more agreeable, but more particularly because they will have the morning sun, and be sheltered from the afternoon sun in summer and from the strong west winds in winter. While it is probable that the entrances at the west end of the building will be more frequently used than those at the east end of the building, it is presumed that the larger number of people visiting the building will enter it at the center of the north side, so that the location of these departments would make no difference in the dis-

ance to be traversed by those doing business within the building.

Entrances are provided on each of the four facades, those at the east, west and south being at the level of the basement story, and that at the north being slightly above the level of the basement story, and ascending by easy steps inside of the great vestibule. If carriage porches are required, either at the front or at the east and west ends, they can be constructed without modification of the plans but they were thought undesirable, as they necessarily darken the entrances and take away something of the simplicity and directness of approach. If future extensions are constructed, as suggested by the block plan, these extensions could be connected to the main building by vaulted arcades, providing carriage porches at the ground level and passages from the ground and main stories into such extensions. Treated in this manner the effect would undoubtedly be picturesque and imposing.

The legislative chamber is placed in the south wing directly opposite the main entrance and is reached by a grand stairway or "stair of honor" from the ground to the main storey. The chamber has been planned to contain about 600 square feet more than required by the "conditions," as it is believed that this space will be found necessary, though by crowding the seating and moving space it could readily be reduced to the 3,500 square feet required. This chamber has nine large mullioned windows (no stained glass) and will be perfectly lighted thereby, but if skylights are required in addition, the form of the roof permits their installation, though the artistic quality of the room would be marred thereby and they are in fact unnecessary for lighting. Galleries surround the chamber, the speaker's gallery being opposite the speaker and the reporters' gallery being carried down to a lower level on each side of the speaker's throne.

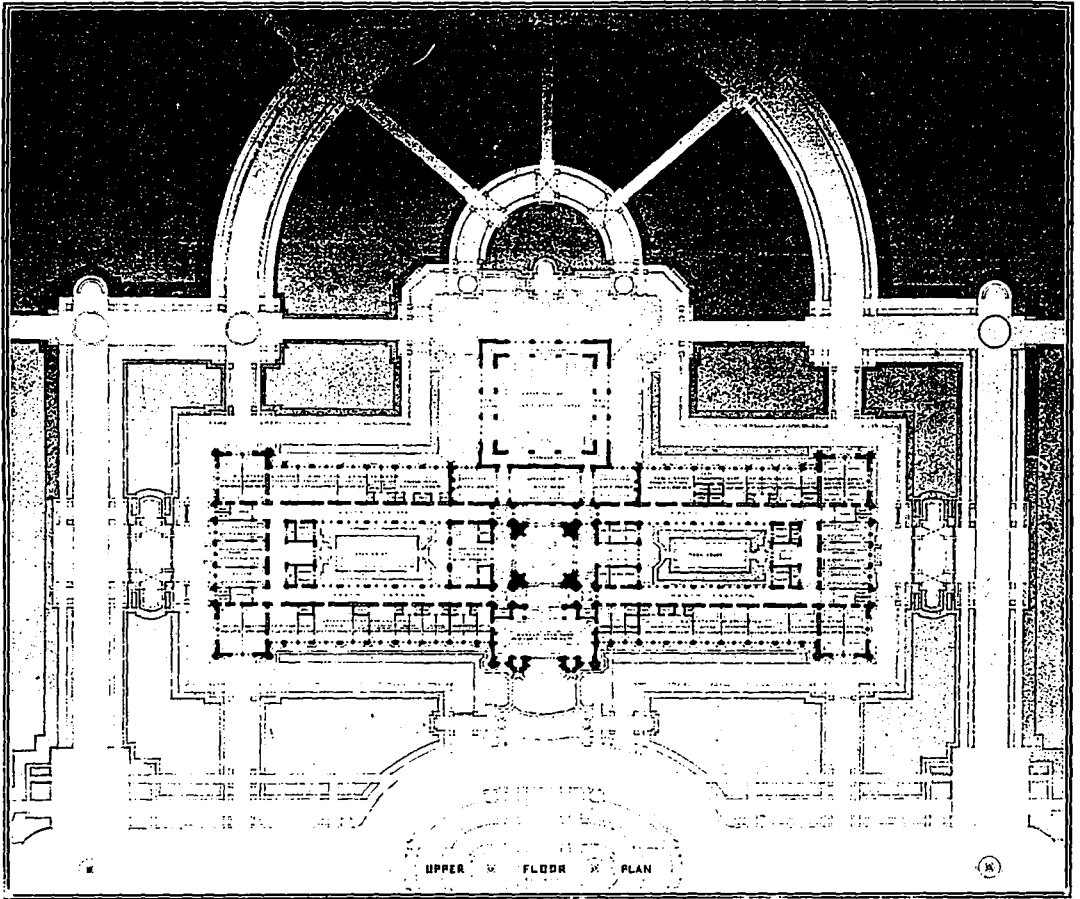
The grand stairway is placed on the center axis of the building and rises from the ground storey to a large platform at half the height and so on to the main storey, also branching to the east and west. The construction of the grand stairway (and in fact all of the stairways) would be of fireproof material, and if required fire doors of metal would be provided so as to shut off each of the corridors at its junction with the main or stair hall, though it is believed that in a building of fireproof construction such additional expense is unnecessary.

The stone screens at the head of the main stairways mask and yet confess the light corridor which provides circulation at the upper floor level.

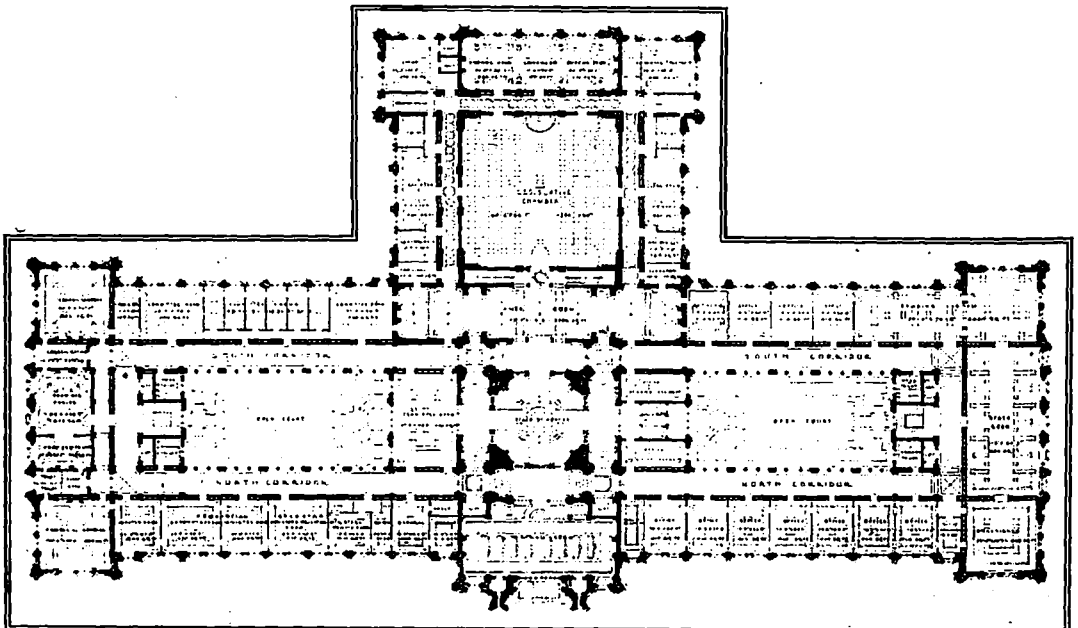
Crossing the main corridor at the head of the grand stairway the ante-room is entered, and from thence doorways open directly into the legislative chamber and into minor corridors surrounding it.

It is understood that the "conditions" do not contemplate or require the legislative chamber, council rooms, committee rooms and the library, etc., should all open directly from the ante-room, but that they should be conveniently located with reference to the ante-room and may be approached from the ante-room without passing through corridors in public use. Assuming this interpretation of the programme to be correct, the council room and library are so placed that they can be conveniently approached from the ante-room but do not connect directly with it. The said approach would be by way of the south corridors which, in times of legislative session, would be reserved for the exclusive use of the legislative body by the emplacement of ornamental iron gates at the points marked "A" on the plan. Such gates might be similar in character to the gates used at the choir entrance and choir aisles in a number of the English cathedrals.

If, however, the programme has been misunderstood in this particular, the space could easily be re-assigned so as to place the council chamber where the large committee room is at the east end of the ante-room, and the premier and governor en-suite to the east of it, while the



PLAN OF GROUNDS, SHOWING ALSO UPPER FLOOR PLAN OF COMPETITIVE DESIGN FOR LEGISLATIVE AND EXECUTIVE BUILDING AT REGINA, SASK.—CASS GILBERT, ARCHITECT.



MAIN FLOOR PLAN OF COMPETITIVE DESIGN FOR LEGISLATIVE AND EXECUTIVE BUILDING AT REGINA, SASK.—CASS GILBERT, ARCHITECT.

library and its dependencies could be placed in a corresponding position in the west wing, this in short being simply a question of reassignment of space.

Surrounding the legislative chamber the minor corridors give access to the speaker's rooms, the smoking rooms, waiting rooms, etc., as indicated on the plans, and private stairways lead from these corridors to the floors above and below. The galleries can also be reached by minor stairways leading from the ante-room and from the main stairway.

The central portion of the ante-room is lofty, while the two ends of the ante-room form large alcoves of less height, above which the corridor system is connected to the galleries, etc. The ante-room is lighted by large skylights and would be designed as an imposing room of mediaeval type forming a fitting approach to the great legislative chamber. While the ante-room has the square foot area required by the "conditions" and would be ample for practical needs, it might well be larger as an architectural feature.

The arrangement of the various departments is clearly indicated upon the drawings, and it is not necessary to rehearse it here. Suffice it to say that the building is designed to be erected on the large unit system, so that the minor partitions can be placed where required independent of the supporting walls and columns, and that the space can be readily reassigned or adjusted to the working needs of the several departments. Experience has shown that such reassignments are always made in public buildings of this character, and it is assumed that the location of a particular room may be varied without prejudice to the success of the competitive design unless the competitive plan should be of such character as to prevent the possibility of such reassignment without important change of its main features.

The location of the executive departments follows closely that suggested by the "conditions," excepting that the provincial secretary is placed in the main storey instead of on the ground or upper storeys, it being understood that the "conditions" are not mandatory in this respect.

The corridor system of the building is made simple and direct and would be well lighted by large interior courts. If, at a later date, it is found desirable to use these courts in the first storey for exhibition rooms or other purposes they can be roofed over by skylights at the second storey floor level, or at the roof, and would form admirable places for public assemblage or for exhibition or museum purposes, and the corridors would be equally well lighted. These spaces, not being required at present, it is thought unnecessary to enclose them by skylights, partly on account of the expense in construction and partly on account of the expense in operation required in heating this additional space in winter. They are not included in the cubage.

It will be observed that all of the corridors, and in fact all the rooms in the building that are in continuous use have direct outside light and command fine views.

The tower, in which is placed the grand stairway and the corridors around it, are amply lighted by mullioned clerestorey windows just above the roof and coming in the upper part of the upper storey.

The "conditions" require that separate entrances be provided for the administrative offices, etc. with cloak rooms. This is understood to mean that in addition to the main entrance hall there shall be separate outside entrances, such as those provided at the east, west and south fronts of the building, and that adjacent to these entrances, cloak rooms should be provided. This condition has been met as will be shown by the plans. It is suggested, however, that individual cloak rooms or locker rooms should be provided for some of the larger departments and for the heads of the various departments of the government, and such provision has been made in the plans.

If entrances to the basement are required adjacent to the main entrance, steps would be placed at each side of the main entrance hall back of the piers, but as the basement is so largely used for storage purposes and not for administrative offices, this was deemed unnecessary, though provision is made in the plans so such access may be had if needed.

Referring to the library, the "conditions" require that the stock room shall be capable of future extension. Such extension could readily be provided above the arcade hereinbefore suggested as the connecting link between this building and a future building to be erected on the site, or the stock room could be extended into the room at the northwest corner of the building, which is at present unassigned.

In some of the vaults the square foot area is apparently less than stated in the "conditions," but the requirements are so unprecedentedly in excess of the usual proportion to the practical needs that the suggestion is ventured that practical experience in public works shows not over 15 per cent. of the documents on file are in active use; and that when these are placed in easy reach, especially when the truck system is used (as here) the stationary stacks may well be in two tiers high filling the full height of the vault, and accessible by rolling step-ladders or by small galleries. Furthermore, with the modern steel office fittings it is now the custom in most new public buildings to fit the counters, desks and working tables in the offices with steel fireproof lockers where the active files and books in use are kept on roller shelves. This system has been adopted by most of the large insurance companies where readiness of access to such documents is desired, and is highly approved by public officials in the United States for its manifest practical advantages.

MATERIAL SUGGESTED.

The building would be of the best modern fireproof construction throughout. It is probable that reinforced concrete would be found the most economical for the floor construction and possibly for the interior division walls, but at points of special stress steel columns would be provided and the main walls and tower itself should be of honest masonry.

The interior finish should not be elaborated with marble or expensive finish, though a few of the special rooms, such as the legislative chamber, the ante-room, the council chamber, the premier's and governor's rooms and the writing room should be finished in oak. The legislative chamber should be finished in English oak, than which there is no more beautiful and robust material. The exposed roof framing in the tower, legislative chamber, etc., should be of Puget Sound fir or cedar, stained to the proper color and given a simple oil finish. The floors of the principal entrances and the corridors in and around the tower should be of limestone, and the minor corridors floored with tile.

Woodwork in the offices would be avoided wherever possible. The "baseboards" in the working departments should be of cement, and window and door trim should be omitted, finishing around such openings with cement with absolute simplicity. In other words, the working offices should be made practically working rooms and adorned with simple and agreeable plain color in flat tints, and made as sanitary as possible.

The flats of the roof would be of pitch and gravel laid on cement; the flashing would be of copper.

The glass would be of standard, extra heavy, double strength sheet glass; no stained glass is contemplated.

The system of ventilation and heating would be partly by direct and partly by indirect radiation, with fan pressure or exhaust as needed for ventilation. The spaces above corridor ceilings would be used for distribution ducts

(Concluded on page 47.)

Actual Workings of Specimen Architects' License Law

Report of Secretary of New Jersey State Board of Architects Which Describes in Detail the Exact Workings of the Architects' License Law of That State. Reproductions of Application and Certificate Forms Shown

BEFORE this number reaches our readers it is altogether probable that the Dominion Parliament will have taken action upon the proposed bill to grant a charter to the Institute of Architects of Canada. As to whether this charter is granted or not depends entirely, in our opinion, upon whether the incorporators consent to have the clause making the architectural profession a closed one, eliminated. There is little hope for the bill if this clause is allowed to stand. As to whether or not it is advisable from the standpoint of the profession in general, to have this clause incorporated in the proposed charter, is not a matter to be discussed at this time.

Much has been said both for and against the plan to make the I. A. C. a closed corporation, but the important problem directly confronting the promoters of this organization is to secure a charter, and inasmuch as this clause has met with a vast amount of adverse criticism from many prominent members of the profession and in the technical and daily press, the promoters would be very unwise to force the Government into the embarrassing position of either allowing the bill to pass with this most unpopular clause, or of throwing it out in its entirety.

The Institute of Architects of Canada has a great educational work before it, and it is in the interests of the public as well as the profession that it should receive a charter, and it would be most unfortunate if a few extremists were permitted to kill the whole proposition, in their insisting upon the insertion of an unimportant, unpopular and highly objectionable clause.

As we have often stated in these columns, it is to the interest of the public and the profession alike that there should be some sort of law enacted that would require certain educational qualifications of those who desire to practice the profession of architecture, and that some Government agent should act as the examining board.

The Architects' License Law of Illinois, California and New Jersey, has proven to be the most practical form of such a measure, and would serve as a good example for the I. A. C. to follow in framing a Dominion law to present to Parliament after a charter has been granted the Institute. This should be a work for the Institute after its incorporation, and not a provision to be incorporated in its charter.

We published in our November number the Illinois law in extenso, and it proved of such interest to our readers, who have been following this question of registration, that we have decided to go still further, and, through the courtesy of the New Jersey State Board of Architects, we are enabled to give our readers the third annual report of this board, with reproductions of the various forms of applications and certificates issued by it under the New Jersey law.

This report should be doubly interesting at this time, in view of the fact that the Ontario Association of Architects has before the Provincial Parliament a bill which will, if passed, provide a law which is styled very much after that in force in New Jersey.

The New Jersey law was modelled after the Illinois law, and is practically the same, with the exception that the five members of the New Jersey State Board (among

whom must be at least four architects who have practiced for at least ten years), serve without compensation, while the members of the Illinois Board receive ten dollars per day for the actual time they are engaged in the service.

The following is the 1906 report in full, of Mr. Hugh Roberts, Secretary of the Board:

THE New Jersey State Board of Architects has now been in existence nearly four years and during that time it has done its utmost to carry out the provisions of the law in the broadest possible spirit. The membership of the Board has remained the same since it was originally organized, and its membership at present time is as follows: Mr. Charles P. Baldwin, Newark, N. J., President; Mr. Hugh Roberts, Jersey City, N. J., Secretary and Treasurer; Mr. Arnold H. Moses, Camden, N. J.; Mr. Charles Edwards, Paterson, N. J., and Mr. David B. Frovoost, Elizabeth, N. J. Since the date of the last report, Dec. 1, 1904, twelve meetings have been held, all of which have been regular meetings. The main work of the board at its meetings has been to consider applications for registration and to grant certificates in cases where the applicants have been entitled to them, to hold examinations as is required by Section 9 of the law under which we are operating and to examine and pass upon examination papers submitted by said applicants for certificates. At the present time the law requires all persons to be admitted to practice by examination, save in cases where the applicant is a member of the American Institute of Architects, and the board has so framed its rules as to permit architects to be registered without formal examination in cases where said architects hold diplomas from recognized schools of architecture. In all such cases, however, these architects are required to submit in addition to said diplomas, photographs together with plans and specifications of buildings designed by them and erected under their supervision. When diplomas from such recognized schools of architecture have been examined by the board and the work shown by the photographs, plans and specifications above referred to give conclusive evidence of sufficient technical knowledge and experience to permit the board to waive formal examination, such action has been taken and a considerable number have been thus admitted to practice. The rule under which such action is taken is as follows:

"A diploma of graduation from the full course in architecture in any university or technical school approved by the Board may be accepted as satisfactory evidence of a competent knowledge of architectural design and construction and shall entitle the recipient to a certificate to practice as an architect in the State of New Jersey, provided said applicant shall present satisfactory evidence to the Board that he or she has acquired the ability to successfully apply his or her knowledge to the designing, construction and supervision of buildings, and shall have paid the fee of five (\$5.00) dollars for admission to examination and the additional fee of fifteen (\$15.00) dollars as prescribed by the Act."

At the present time there are seven hundred and twenty-six (726) persons who are regularly registered as practicing architects in the State of New Jersey; of this number five hundred and eleven, (511) were admitted under section 10 of the original Act, which requires the issuance of certificates without examination to all persons who were practicing in the State of New Jersey upon

[NOTE:—Since this article was put in type we are pleased to state that the clause providing for a closed corporation and licensing of architects has been struck out of the proposed bill to incorporate the Institute of Architects of Canada.—Ed.]

the date that the law went into effect, viz.: March 24, 1902. Since the date of the last report, Dec. 1, 1904, eighteen (18) persons have been admitted to practice under the provision of section 10 of the Act which requires that certificates shall be issued to members of the American Institute of Architects without examination.

The total number of Institute members who have been registered in the State of New Jersey to date is one hundred and nine (109). One hundred and seventy-five (175) certificates have been issued to persons who have had much experience as practicing architects, most of them being from other States. These architects have been examined by the board and have received certificates. In all cases they have been obliged to furnish exhibits satisfactory to the Board, consisting of diplomas from recognized schools of architecture together with the photographs, plans and specifications of work designed and erected under the supervision of the applicants as previously referred to. In many cases after having examined diplomas, photographs, plans, specifications, etc., submitted by the applicants, the Board has referred said ap-

the law under which we are working does not provide for the expenditure of the moneys of the Board for the proce-

State of New Jersey.



APPLICATION FOR EXAMINATION FOR CERTIFICATE

Under the Provisions of Sections 9 and 10 of an Act to Regulate the Practice of Architecture (Approved March 24th, 1902.)

To The New Jersey State Board of Architects:
1 EXCHANGE PLACE, JERSEY CITY, N. J.

I hereby apply for a certificate to practice the Profession of Architecture in the State of New Jersey, under provisions of Sections 9 and 10 of the above mentioned Act, and enclose herewith the lawful examination fee of Five (\$5.00) Dollars. All checks should be drawn to the order of N. J. S. B. of A.

My full name is _____
My Post Office address is (Street and Number) _____
City and Town _____ County _____
State of _____

Statement of the Applicant.

(It is optional with the applicant whether or not he fills blank 12, or accompanies this application with other matter, and his or her right to obtain certificate will not be abridged by such omission, as the filling of such blank will be regarded as part of an examination only in certain cases, as for instance those of practicing Architects in other States desiring certificate in this State. All accompanying matter must be sent by mail or express, prepaid, and will be returned at the expense of the applicant.)

FORM OF APPLICATION FOR EXAMINATION FOR CERTIFICATE.

plicants to the regular class examinations after it had been made clear to the Board that they did not possess sufficient knowledge and experience to entitle them to a certificate. Everyone over 21 years of age is privileged under the Act to take the regular class examinations. Since March 24, 1902, forty-three (43) persons have been examined in the classes, the examination requiring three continuous days' work on the part of each candidate. Of the entire number who have taken the class examination, twenty-three (23) have successfully passed and have received certificates and twenty (20) have been rejected. Of the entire number of architects practicing, the certificates of sixty-eight (68) have lapsed, owing to the provision of the law which requires that an annual fee of \$5.00 shall be paid by each architect in practice, and in all cases where the fee is not paid the certificate of the holder becomes void.

Quite a number of complaints have been received from various parts of the State concerning violations of the law, and while some of the complaints were trivial in their nature, others were of considerable importance. As

1. Give the name of your birthplace and that of the State or County in which you were born.	
2. State your age on your last birthday.	
3. What is the extent of your general education? State whether you have received a common school, high school or college education.	
4. (a) Have you attended any scientific, professional, or technical school? If so, state what school. (b) What law has your attended such school, whether or not you were graduated, and if so, state date of graduation.	
5. Have you pursued any post-graduate course of study? If so, state what studies, when and where.	
6. Have you pursued any technical, scientific or professional studies in any other manner than those mentioned?	
7. Have you received any degree or degrees? If so, state what degree or degrees, by what institutions conferred, and give the date or dates on which received.	
8. Have you any experience in the practical application of your knowledge in the ordinary professional work of an architect, and in the duties of a supervisor of construction work on buildings, and in the utilization of your knowledge of the laws of mechanics as applied to buildings? If so, state the exact character and lengths of such experience.	
9. Have you served as the employee of any person or persons in the discharge of duties pertaining to the practice of the profession of architecture? If so, give the names and their Office addresses of not more than three such persons, firms or corporations, and the dates employed by each, and the nature of such employment.	
10. Are there any branches of architectural practice in which you regard yourself as especially expert? If so, state what branches.	
11. What has been your occupation for each of the past five years?	1900..... 1901..... 1902..... 1903..... 1904.....
12. If you have been the architect of any building or buildings, either independently or in connection with others, commencing not more than three of such buildings, state their location, give the names and Post Office addresses of their owners, and illustrate them by submitting photographs and descriptions or plans and specifications thereof.	

Signature of Applicant.....
PAGE 2 OF APPLICATION FORM FOR EXAMINATION FOR CERTIFICATE SHOWING THE QUESTIONS THAT MUST BE ANSWERED BY APPLICANTS.

cution of violators, and inasmuch as we have been advised by counsel that in the absence of such a provision in the law itself the Board could not legally expend its funds for such a purpose, the work of prosecuting violators is still in the hands of a committee of the New Jersey Chapter of the American Institute of Architects, which body is a chapter of the national body, the membership of which consists of the best practitioners from all parts of the State. Many architects have voluntarily contributed various amounts to the Chapter for the work of prosecution and almost all of the violators, after having received due warning, have ceased to continue their former practices, which were considered illegal. The committee of the chapter has done good work in handling these complaints, and through its efforts many persons have been warned and have promptly qualified as regularly registered architects.

The assistance given the Board by the New Jersey Chapter has relieved it of much work which is not in-

AFFIDAVIT.

(To be attested before a Notary Public or other officer authorized to administer oaths.)

STATE OF _____ COUNTY }
On the _____ day of _____ 190____
before me a _____ came _____
of (City or Town) _____ County, and State
of _____ knows to me as the person herein
described and subscribing hereto, and as having signed the Form of Application
attached hereto, and on oath deposes that the statements made therein as parts
of said application are true.

(Signature of Affiant) _____

Subscribed and sworn to before me this _____ day of _____ 190____

(SEAL)

FORM OF AFFIDAVIT WHICH ACCOMPANIES APPLICATION FOR EXAMINATION FOR CERTIFICATE.

cluded in the regular duties conferred upon the Board by the Act of 1902, and has enabled it to carry on the examinations for registration and other work without the serious friction which would be caused by the prosecution of violators. This work of prosecution has in no way been overlooked, but has been cared for to better advantage by the Chapter, due to the fact that this body is an association altogether independent of the State Board.

reason a great majority of practitioners were entirely unfitted to do the work which they held themselves out to the public as being able to do. Important commissions in many cases were entrusted to persons entirely unfitted to execute them, and the result was that many of the buildings erected throughout the State were poorly designed and constructed, and from a business standpoint were executed in such a way as to create much dissatisfaction on the part of the clients for whom they were erected.

The public did not stop to consider the reasons responsible for the low standard of ability existing in the architectural profession and did not apprehend that much training and experience is necessary in order to produce good buildings, and for this reason the necessity for the law regulating practice was not recognized many years ago. The good produced is unquestioned, and very few years will elapse before a decided improvement in designing and construction of buildings will be very apparent to the most unobservant of our people.

The requirements of the examinations conducted by the Board are briefly as follows: They consist of two and a half days' work, beginning at 9 a.m. and ending at 5.30 p.m., the afternoon of the third day being allowed for the completion of any unfinished work. The first day's work has usually consisted of working out of a problem as if given by client to an architect. The student is as a rule required to prepare 1/8" sketches of the floor plans and elevations of a residence either of a city or cottage type as may be the case. The requirements of the various floors are given and the student is required to work them out in his own way. The preparation of these sketches shows at once what the student is able to do in designing, planning, and also indicates clearly his ability as a draughtsman. The second day's work has usually been directed toward ascertaining the ability of the applicant as a constructionist. The problems given have consisted of computations as to the thicknesses of walls and footing courses required for sustaining given loads.

The calculations as to the sizes and weights of columns, girders and steel floor beams, have been called for upon various occasions, and upon other occasions calculations have been required concerning the sizes of col-



WHEREAS _____ has shown by affidavit to the satisfaction of **THE STATE BOARD OF ARCHITECTS** that _____ and is registered in the practice of Architecture at _____ and State of New Jersey on the twenty fourth day of March, 1902 and is therefore entitled to a **CERTIFICATE to practice Architecture** without an examination by **THE STATE BOARD of Architects** **NOW THEREFORE** by virtue of the powers vested in it by **THE STATE OF NEW JERSEY** the said Board of Architects having received the lawful fee of Two Dollars **HEREBY LICENSES** the said _____ to practice Architecture in the State of New Jersey as provided in an Act to regulate the Practice of Architecture approved March 13th 1902 subject to the Provisions of the Resolution passed in said Board by said Act.

Signed and attested by the seal of the Board of Architects this the _____ day of _____ 1902

Approved in the office of the Secretary of State at Trenton, New Jersey this _____ day of _____ 1902 and recorded in Book _____ of the New Jersey State Board of Architects on page _____

FORM OF CERTIFICATE ISSUED TO APPLICANTS ENGAGED IN THE PRACTICE OF ARCHITECTURE AT THE TIME OF THE PASSAGE OF THE LAW.

The annual fee is now paid without any question whatsoever, and it is somewhat surprising, in view of the fact that nearly 800 architects are registered, that objection has not been made to the payment of the fee by more than two or three at the most. The reason for this is that the payment of the annual fee has been generally accepted by architects as a wise provision of the law, providing as it does for no more than the reasonable expenses to which the Board is necessarily subjected. Upon the perusal of the annual report hereunto attached, a knowledge of the entire receipts and expenditures may be obtained. The requirement of the law providing for this annual fee has resulted in relieving the profession of quite a number of persons whose work was inferior and it also has had the effect of causing many builders who formerly prepared plans to cease so doing, thus confining their efforts to the actual work of construction.

Most of the builders who formerly prepared plans have realized that it is better for them to adhere strictly to their own particular line, and quite a number of those who originally secured certificates have allowed them to lapse after having concluded that it would be better for them to cease attempting the practice of architecture. The payment of this fee has thus had the effect of raising the standard of practice. The interest shown in preparing for the examinations has been especially pleasing and noteworthy. The Secretary of the Board is constantly in receipt of communications from young men who desire to study to prepare themselves for the examinations. The Board is much pleased to recommend proper books and proper courses to be taken in order that every young man who desires to fit himself for practice shall have the means at his command to do so. It is exceedingly encouraging that the law has had the effect of stimulating an effort on the part of many young men to properly fit themselves by hard work for the practice of the profession of architecture.

Attention was called in the last report issued by the Board to the fact that the practice of architecture had degenerated to a very low point, for the reason that anyone was free to start to practice without any previous training or proof of ability being required. For this



WHEREAS

_____ and is therefore entitled to a **CERTIFICATE to practice Architecture** without an examination by **THE STATE BOARD of Architects** **NOW THEREFORE** by virtue of the powers vested in it by **THE STATE OF NEW JERSEY** the said Board of Architects having received the lawful fee of Two Dollars **HEREBY LICENSES** the said _____ to practice Architecture in the State of New Jersey as provided in an Act to regulate the Practice of Architecture approved March 13th 1902 subject to the Provisions of the Resolution passed in said Board by said Act.

Signed and attested by the seal of the Board of Architects this the _____ day of _____ 1902

Approved in the office of the Secretary of State at Trenton, New Jersey this _____ day of _____ 1902 and recorded in Book _____ of the New Jersey State Board of Architects on page _____

FORM OF CERTIFICATE ISSUED TO APPLICANTS WHO ARE MEMBERS OF THE AMERICAN INSTITUTE OF ARCHITECTS OR OTHER LIKE ORGANIZATIONS OR WHO MAY HOLD A LICENSE FROM SOME OTHER STATE AND WHO ARE ISSUED A LICENSE ON THE STRENGTH OF THIS FACT.

umns, girders and timbers necessary for buildings erected along the lines of mill construction. The student has at times been required to design a roof truss, computing the sizes of the various members of the said truss after the span and weights have been given. Questions concerning

the sizes and weights of beams necessary to support distributed or concentrated loads have also been among the problems given. The third day's work has usually been confined to specification writing and questions upon superintendence relative to the qualities of various building materials, with the view of ascertaining the applicant's knowledge of the defects as well as the good qualities of various material ordinarily used in building work. Questions are asked concerning the requirements of good foundations, of good brick work, stone work, cast iron work, carpentry, joinery, timmer's work, plastering and painting. These questions are as a rule asked to determine the candidate's ability to make practical application of his knowledge in the regular work of an architect. Questions upon sanitation are frequently included referring to such subjects as soil pipes, traps, plumbing fixtures, cold and hot water supply, hot air furnaces and pipes and hot water heating and ventilation, besides many other subjects which come up regularly in the practice of the profession.

Many of the young men have passed a very creditable examination, while quite a number have, as heretofore mentioned, utterly failed to come up to the standards required. The Board has endeavored to make its examinations as reasonable and as practical as possible, so that anyone who possesses a sufficient knowledge may readily qualify without being compelled to answer questions which in no way would affect his ability to practice the profession. All catch questions and other unessential features have been carefully eliminated from every examination paper.

The specific benefits arising from this law are very apparent to the Board. We do not expect the people of the State to observe the beneficial effects as readily as we do ourselves, but it has been very gratifying to find so many builders, particularly builders of the better class, who have observed its beneficial effects and have enthusiastically commended its enactment. Architects themselves say that it is producing a better class of architects. The builders are so pleased because the plans which they receive to estimate upon are more complete and much more carefully drawn, enabling them to not only estimate more carefully, but also enabling them to construct a better class of building, both in appearance and in construction.

All builders like to figure upon well designed and carefully prepared plans, and they heartily commend any law which produces this result. As previously stated, many of

ings which are now being constructed in such large numbers in all parts of our State.

Very respectfully submitted,
(Signed) HUGH ROBERTS,
Secretary.



WHEREAS THE NEW JERSEY STATE BOARD OF ARCHITECTS after due examination has become satisfied that

of County of _____ and State of _____
is possessed of such knowledge of the construction of buildings of the strength of material of the laws of sanitation as applied to buildings and of such ability to make practical application of this knowledge to the ordinary professional work for which he is licensed to practice as ARCHITECTURE IN THE STATE OF NEW JERSEY NOW THEREFORE by virtue of the powers vested in it by the State of New Jersey the said Board of Architects having viewed the lawful seal of Alfonso G. Davis HEREBY AUTHORIZES the said _____ to practice Architecture in the State of New Jersey as provided in an Act to regulate the practice of Architecture approved March 27th 1902 subject to the Powers of Revocation vested in said Board by said Act.

Witness my hand and seal of the Board of Architects this _____ day of _____ 1907

Given in the office of the Secretary of State at Trenton this _____ day of _____ 1907 and recorded in Book _____ of the Public Records.

FORM OF CERTIFICATE ISSUED TO APPLICANTS WHO HAVE PASSED THE REQUIRED EXAMINATION.

Gothic Design in Regina Competition

(Continued from page 43.)

for heat and ventilation and for the passage of pipes and wires. Ample vertical flues are also provided in the walls and at certain points. It is assumed that a small and low power building would be erected on a convenient point in the vicinity of the building.

In estimating the cost of the building the sum of three cents per cubic foot as required by the "conditions" has been allowed for the power plant, heating and ventilation, though it is possible that this sum will be insufficient.

In estimating the cost of the building the schedule of current rates at Regina (quoted on page 9 of the "conditions") has been carefully considered.

CUBIC CONTENTS.

A careful estimate of the cubic contents has been made on the basis stated in the official letter of September 24, 1907, and assuming that the level of the "top of the footings" will average 8 feet below the basement floor, and also assuming for the purpose of calculation that the height of the general structure should be taken to the mean or average level of the roofs, and the dimensions of the tower to include the average projection of the buttresses, the following figures are found and are believed to be as accurate as possibly can be made from preliminary drawings at the required scale:

Sub-basement (i.e. all below top of basement floor level)	480,000 cubic feet, at an average cost of 20c. per cubic foot .. \$	96,000.00
The building proper from top of basement floor to mean level of main roofs, 3-	480,000 cubic feet, at 31c. per cubic ft..	1,078,800.00
Tower from roof to top inclusive, including average projection of buttresses, 345,600	cubic feet, at 21c. per cubic foot.....	72,555.00

Total cubage 4,305,500 cubic feet.
Estimated total cost.....\$1,247,355.00

The above estimate of cubical contents totalling 4,305,500 cubic feet, measured in compliance with the requirements of the "conditions", is guaranteed to be a correct measurement from said drawings. The foregoing is respectfully submitted.



WHEREAS his alors has shown to the satisfaction of **THE STATE BOARD OF ARCHITECTS** his competency and fitness to practice Architecture NOW THEREFORE by virtue of the powers vested in it by **THE STATE OF NEW JERSEY** the said Board of Architects HEREBY LICENSES the said _____ to practice Architecture in the State of New Jersey as provided in an Act to regulate the practice of Architecture approved March 27th 1902 subject to the Powers of Revocation vested in said Board by said Act.

Witness my hand and seal of the Board of Architects this _____ day of _____ 1907

Given in the office of the Secretary of State at Trenton this _____ day of _____ 1907 and recorded in Book _____ of the Public Records.

FORM OF CERTIFICATE ISSUED TO APPLICANTS WHO HAVE PROVEN TO THE SATISFACTION OF THE BOARD THEIR FITNESS TO PRACTICE ARCHITECTURE WITHOUT AN EXAMINATION.

the people not connected in any way with building matters are now beginning to observe the beneficial effects derived from the law, and it is the hope of the Board that within a very few years everyone will observe a very great change for the better in the character of the build-

The Cement Stucco House

Adaptability of Cement Stucco in Residence Construction, Showing its Artistic and Utilitarian Advantages. Points to be Observed in its Use. Two Canadian Examples

WITH the invasion of the *Spanish Mission* mode of interior decoration, into the northern part of the United States and Canada, an increasing demand for cement stucco exterior effects in residence construction—which might well be styled typical Spanish-American or Mexican, since, for ages, it has been in almost universal application among the Mexicans—appears to have arisen. Considerable development along this line has been marked in Canada within the past five or ten years, until good examples, in both design and finish, are by no means rarely met with.

Sometimes the cement stucco finish is applied to houses of monolithic concrete construction; sometimes to the exterior of frame structures upon expanded metal or wood lath; while more frequently in the cities of Ontario and Quebec provinces we find very beautiful stucco effects covering solid brick walls.

Let us consider then the virtues of the cement stucco finish. Ten years ago most of the exterior plaster work done—outside of the Southern States and Mexico—was in connection with half-timbered construction, or on gables where it fulfilled an ornamental rather than a structural purpose. This gradually brought into consideration its lasting qualities and artistic possibilities, and established it in greater favor with architects and builders.

Properly mixed and carefully applied it was found to provide a much more durable, warmer and more attractive surface than shingles or clapboards. From what is known of Portland cement that has been allowed to properly set or crystallize, we cannot conceive of age affecting it in the way of deterioration, more—or in fact as much as exposed brick or stone in a building. The whole outside of a cement stucco structure, excepting the door and window openings being a solid plate or flag of cement, and being of such a dense, cohesive nature, makes an unusually warm enclosure, which is impervious to wind and moisture.

TWO ADVANTAGES.

It is partly for this reason that the cement stucco finish is applied to the surface of brick residences in climates where the thermometer and barometer vacillate aggressively between the extremes of heat and cold, and where mild, fine and stormy weather alternates. With a dense coating on the outside of a brick wall the temperature of the residence is perforce maintained at an even gauge more easily than under other conditions, so that not only is a considerable saving recorded in the fuel account each year, but the inmates are more or less spared in health from seasonable maladies to which the human flesh is heir. This is, likewise, to a certain extent true of the cement plastered house of wood construction as compared to the ordinary frame structure, due to the fact that the cement being applied in a thoroughly saturated state sets both in a hard and dense manner, and thus precludes moisture and expels the wintry blast.

The superiority of the former type of construction over the latter is comparable to the superiority which brick naturally holds over frame, with about an equal difference in the cost.

But, aside from the utilitarian point of view, the chief quality of the cement stucco house is its appearance. It was this feature that led to its adoption by the wealthier class of people throughout the State of California, after Mexico had long been dotted with houses, hospitals, missions, etc., faced with cement stucco walls. Their gables, arches and parapets, and above all their

hospitable aspect, seemed to blend exceedingly well with the California landscape and requirements. The effect of climbing vines gave a most restful appearance to the rugged walls. Later they came to be adopted quite extensively in the fashionable districts of New York, Boston and other eastern American cities, many of them, when completed, running into the twenty-five thousand dollar mark. The difficulty of creating designs that will effectively carry the material has been one of the chief drawbacks to this type of residence construction. Many miserable attempts have been made along plain, regular lines, producing invariably, a stumpy, barren and altogether unsightly whole, that lacked the first essential of a home, namely, it could not be made to appear inviting.

DESIGN IMPORTANT.

To build on regular lines, the designer must take into consideration the massive appearance of this material, and at least project eaves or cornice, with possibly the addition of a heavy appearing verandah, in order to give the walls the appearance of having something to support. The window casements must be set well in, deep in fact, into the walls, and the chimneys must, wherever they appear to view, stand out bold and if possible to do so they should be made to extend beyond the exterior wall several inches (all, of course in proportion to the size of the structure).

Best effects can be obtained, however, by adhering more closely to the Spanish ideas, breaking up the flat surfaces with hoods, or penetrating them with alcoves or balconies set well in, behind substantial appearing pillars. Gables may be projected high above the roof peak, the top edge describing a series of graceful scallops from the side walls to the highest angle. Heavy parapets are sometimes worked into residences of this type with pleasing effect. To further carry out the idea of monolithic construction, which in appearance it is hard to get away from in cement stucco work, it has been found agreeable to run bands and beltings, appropriately distributed, upon the walls, while, the parapets are capped with broad copings in cement.

Some of these effects may be noticed in the two illustrations accompanying this article, which have been pronounced splendid examples of this type (cement stucco on brick) of residence construction, both in the matter of design and construction. From an artistic standpoint, cement exteriors are incomparable. Pebble finished plastering gives an effect of life and attractiveness to the cement work of a building that harmonize with the landscape unusually well. A small per cent. of dry mineral in soft shades added to the last coat gives modest and agreeable tints much more harmonious to the surroundings than is possible to obtain with paint. The comparatively large surfaces of pebble work are never monotonous, because of the endless play of light and shades. Cement exteriors will wear better than stone and acquire with age the correct tone. Another practical item of extraordinary importance is that, if a wooden building be considered a first-class investment for twenty years, a cement stucco building may more conservatively be considered a first-class investment for fifty years.

EXPERIENCE NECESSARY.

Most of the failures that have occurred in exterior plaster work have been caused by lack of experience or by neglect on the part of the superintendent or contractor to use the best materials in the proper way. Each plasterer who has had years of experience in this work is quite likely to have certain methods quite his own

but there are a few general rules that must be followed by everyone in order to produce satisfactory results. Unless circumstances are such that one can procure an experienced superintendent to stand over his men every minute during the plastering and see that his orders are carried out, it is well worth while to have exterior work done by an experienced plasterer. Success depends absolutely on first-class methods and materials.

Some buildings of this style have proven failures for the following reasons:

First, ignorance as to the principles of lathing, mixing and applying cement. A plasterer may have a full mechanic's experience in general and in ornamental plastering, and yet he will not in all probability know some of the technical, or rather the scientific principles which the successful use of Portland cement for plaster work demands.

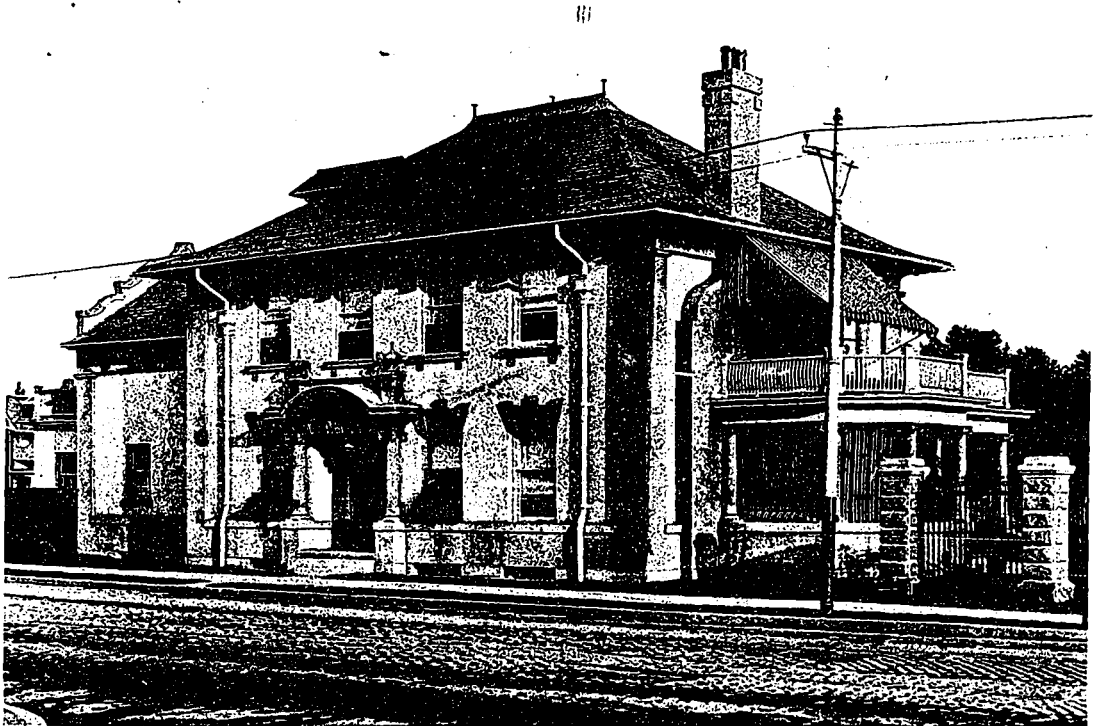
Second, it is never safe to mix cement plaster for ex-

terior to be less harmful. The result of thus using lime will be disastrous, for right in these first and second coats of the cement stucco is where the strain comes and where the strong cohesion of Portland cement is most needed.

Again, the finishing work may be improperly done so as to give a listless effect to the appearance of the building. There are a number of other essential items that careful painstaking study, investigation and experience have brought forth, and which materially affect the success of this valuable style of building construction.

GOOD FOUNDATION ESSENTIAL.

The use of any kind of masonry in buildings requires a good foundation. This is also true of cement plastered buildings. Any settling of a poor foundation would mar the face of the walls with cracks that are



HOUSE NO. 1.—RESIDENCE OF DR. HOIGE, TORONTO. A GOOD EXAMPLE OF CEMENT STUCCO ON BRICK IN HIGH CLASS RESIDENCE CONSTRUCTION. THE BUILDING HAS MANY ADDITIONAL FEATURES IN ITS PLAN THAT ADAPTS IT ADMIRABLY FOR A DOCTOR'S RESIDENCE, OFFICE AND SURGERY. HENRY SIMPSON, ARCHITECT.

terior work by hand: that is, with a hoe and box like plaster for inside walls. The proportioning of the cement with the other materials must be exact and the mixing must be thorough, so that the cement, which is the life of the plaster, is equally distributed. Otherwise, some parts of the plaster which would be too lean might crack and fall off under strain and exposure. Mixing with a machine is the only safe process.

Third, the improper proportioning of the other parts to the mixture besides the cement may cause failure. For instance, the use of lime, which is necessary to a limited extent in this work, may be abused in the first and second coat mixtures where it may be thought to be out of sight or where its free use may be thought

very objectionable: in fact, the contractor would not be justified in applying cement stucco on any building with a poor foundation under any circumstances whatever. It is preferable, although it is not absolutely necessary, to have a full basement under a cement stucco building. The cost of a full basement above what it would cost to wall part of the basement and put a good foundation under the balance of the house is small, and the full basement can be finished at any time in the future, if not at once, by plastering the walls and ceiling with cement and by concreting the floor.

WE have chosen for illustration this month, two examples of the brick and stucco type of residence; that is, houses which are to all intent and purpose

substantially constructed of brick, but coated entirely on the exterior with cement. No. 1 was designed by Architect Henry Simpson, and No. 2 by Messrs. Ed'n Smith and Son, of Toronto.

It frequently happens, in attempting a photographic portrayal of a structure, particularly in congested city localities, that a justifiable view cannot be obtained, on account of the proximity with which other objects cluster around the one that is chiefly intended for reproduction. Such conditions maintained in these instances. Both houses are admirably adapted to their surroundings and show up handsomely from any direction of approach: but to obtain an adequate view at long focus would be impossible because the camera would do the principal object the injustice of allowing nearer scenes to feature. Both structures have been of necessity erected close to streets, obviating the pictorial advantages of a lawn setting and necessitating a close focus, which precluded any opportunity of securing panoramic perspectives.

However, when it is said, and said truly, that from any of four approaches toward either of these residences, they both stand out strikingly and in picturesque relief against the environment of fashionable brick or brick and stone dwellings with their varied color and shingle or timbered effects, it will relieve the minds of any persons who are dubious as to the decorative qualities of cement stucco finish, as applied to the modern residence.

House No. 1 is the residence of Dr. Wm. Hoidge, Toronto, situated on the corner of Palmerston boulevard and Bloor street, designed by Architect Henry Simpson and erected by Hoidge & Sons, plastering contractors. A more substantially built house scarcely could be desired. The entire exterior walls are of solid brick, 14 inches thick, and reinforced on every corner with pilasters. In addition, two of the walls are strengthened by the presence of broad English chimneys extending 6 inches beyond the face of the building proper. Also, the carrying partitions following the centre corridor on either side, are built of brick 9 inches thick and carried up to the attic floor, giving a firm support to the centre of the heavy slate roof. This feature may be considered superfluous by some, as the formation of the roof provides for the distribution of the weight to the four outside walls.

All trimmings, including the base, pilasters, columns, frieze, cornice, side-door head, and broad English chimneys are treated with a fine cement stucco, while the panels are finished in a roughcast.

The concrete foundations enclose a full basement with a cement floor and containing a laundry, coal rooms,

furnace room and billiard room (it is not uncommon to find billiard rooms in the basement of the modern residence). A wooden floor is laid upon the cement in the billiard room, the side walls are wainscoted to a height of five feet, and the ceiling is beamed and finished in imitation of antique oak. A separate stairway underneath the main stairs connects this compartment with the front vestibule on the ground floor.

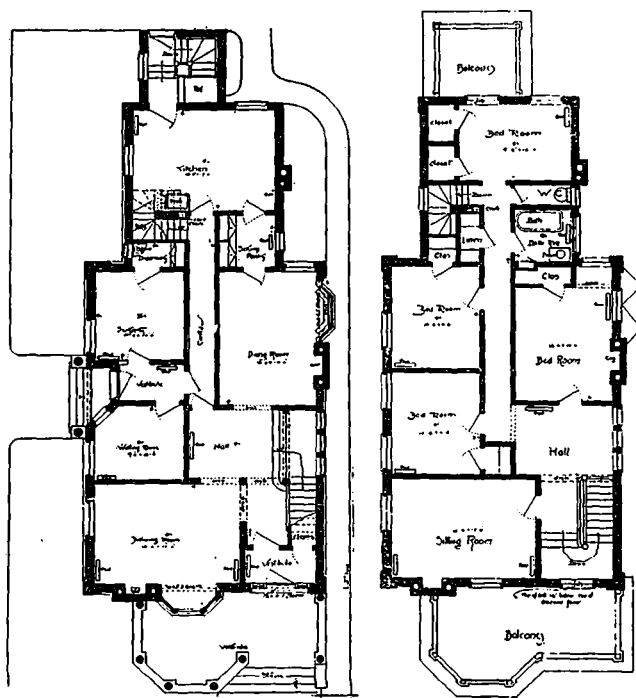
From the fact that this structure was planned from the beginning to accommodate the doctor's office in addition to its being a residence, it should contain features of more than usual interest. Combinations of this nature are by no means uncommon in cities, but where they do occur, the physician's offices are usually an after consideration and are adapted from what was originally intended as parlors or drawing rooms, thus conflicting with and altering the domestic conveniences of the place.

The surgery in this case has been cut off from the living section of the building by the provision of a separate entrance from Bloor street, on the north side. This entrance is broad and business-like, comprising a

deep recess flanked on either side by monolithic Ionic columns, and sheltered slightly overhead by a neatly proportioned hood—a projection which beautifully relieves the face of the extensive wall and renders the aspect from the north approach most pleasing. This entrance leads into a vestibule opening into a waiting room on the right and the surgery on the left, while directly opposite the entrance is a door leading to the main corridor of the residence section. Both the waiting room and the surgery are fitted with mirrored gas mantles, have stained windows, and are finished in birch, mahogany stained. The surgery is provided with a stationary bookcase over the radiator, and is equipped with a dispensing closet and supplied with a special built-in basin and drug cabinet.

Entrance to the residential section of the building is gained

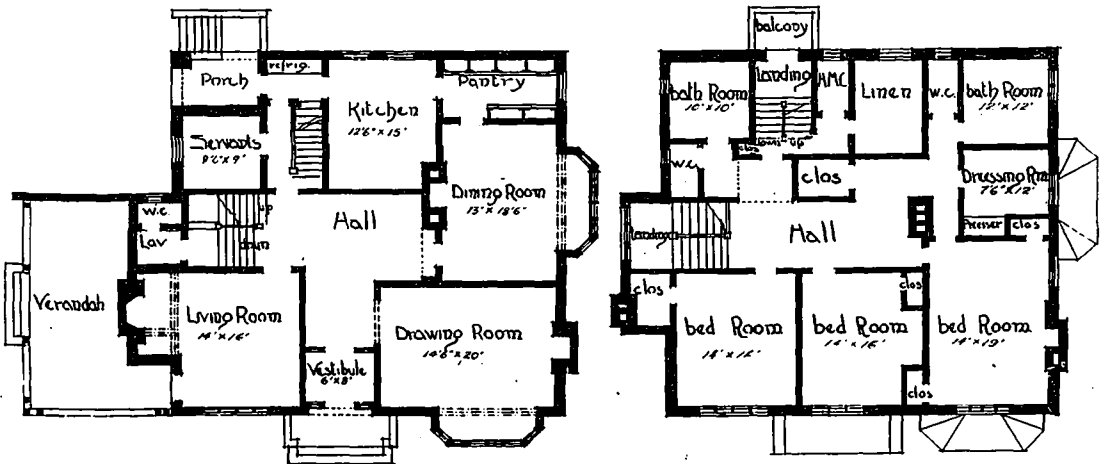
through a broad oak door, flanked by panelled windows and leading to a roony vestibule, which in turn opens into a rather unusual hall running almost the full length of the house, but broken by two jogs. A reference to the plan of the first floor will best explain the arrangement. The first portion of the hall leads to two curtained arches, the one to the left giving access to a commodious and well-lighted drawing room, while the archway directly ahead reveals the second installment of the main corridor—somewhat broader than the first passage, but nevertheless a part of the same. This jog is really the tie which keeps each portion of the house from becoming a stranger with the rest. It joins the first and second installments of the main corridor, thus



PLANS OF HOUSE NO. 1.—FIRST AND SECOND FLOOR PLANS OF DR. HOIDGE'S RESIDENCE. THE LOCATION OF THE WAITING ROOM AND SURGERY OF THE DOCTOR'S SUITE ON FIRST FLOOR IS SO ARRANGED AS TO ENCROACH IN NO WAY ON THE PRIVACY OF THE HOUSEHOLD. HENRY SIMPSON, ARCHITECT.



HOUSE NO. 2—ANOTHER EXCELLENT EXAMPLE OF DOMESTIC ARCHITECTURE, IN WHICH THE ARTISTIC APPLICATION OF CEMENT STUCCO ON BRICK IS FAIRLY DEMONSTRATED. ONE OF THE FEATURES OF THIS HOUSE IS THE DEEP VERANDAH WHICH IS REACHED THROUGH THE LIVING ROOM LOCATED OFF THE RECEPTION HALL. EDEN SMITH AND SON, ARCHITECTS.



PLANS HOUSE NO. 2.—FIRST AND SECOND FLOOR PLANS, SHOWING SPLENDID ARRANGEMENT IN WHICH SPACE HAS BEEN UTILIZED TO THE UTMOST ADVANTAGE. ALL THE LIVING ROOMS ON THE FIRST FLOOR ARE LOCATED OFF THE RECEPTION HALL. THE KITCHEN AND SERVANT QUARTERS ARE SITUATED SO AS TO BE VIRTUALLY ISOLATED FROM THE REST OF THE HOUSE. THE LOCATION OF THE PANTRY, WITH ITS BUILT-IN SHELVES, IS ANOTHER FEATURE WORTHY OF NOTE. EDEN SMITH AND SON, ARCHITECTS.

connecting the surgery and the kitchen with the front portion of the house; affords a broad and direct passage-way between the drawing room and dining room, by means of curtained arches, and makes the connection between the upstairs and first floor. By the arrangement of the four closely allied archways referred to, a particularly rich appearance is given to this portion of the house, the vista from either the fireplace in the dining room toward the front drawing room window, or vice versa, being exceptionally engaging. The first landing of the main stair is 3 ft. 6 in. by 8 ft. in dimension and is finished in quartered oak, as is the first floor hallway throughout. The woodwork in the drawing room is white enameled. A broad fireplace, supporting a heavy mantel; and an extensive bay window, into which low stationary seats have been provided, penetrate the front wall of this room, while a large window, commanding a view of Bloor street and the northern approach from the boulevard, breaks the north wall.

The dining room is finished in paneled oak, with figured burlap covering the walls up to the plate rail from which the curves of the covered stucco ceiling spring. A brick fireplace and bay window, identical with those in the drawing room are also found in this room, while adjacent, and communicating directly with the kitchen, is a completely equipped serving pantry.

Although it may appear that considerable space has been taken up by the long corridor or hall, it will be observed that direct communication with the surgery, second floor, and above all, the front entrance, is provided by this arrangement, without the necessity of traversing the dining room. The virtue of this feature will quickly impress itself upon everyone. A direct entrance for tradesmen to the kitchen is provided through the rear porch, which contains a stairway leading to the basement and a built-in refrigerator—convenient to any purpose of the cuisine and keeping the ice-man's muss where it belongs. The walls of the kitchen are finished in cement, tinted with a waterproof coating. The size and appointments of the kitchen leave little to be desired by the housewife, laundry chute, sink, permanent cupboard, stairways (up and down), and plenty of light being satisfactorily looked to in the arrangement.

The second floor comprises four spacious bedrooms, a combined library and sitting room, toilet and bath (separate) and two large balconies—front and rear. The second landing of the main stairs, which opens onto the front balcony, is fitted up with two stationary seats, leather cushioned. The two broad English chimneys, previously referred to, aid materially in the adaptation of this floor, providing opportunity for the location of fireplaces in the front sitting room and main sleeping chamber, located on the south side of the house. An immense linen closet and two large servants' rooms take up the attic space.

Three electric switches in the main hall control the entire illumination of the house, and the wiring is so arranged that the downstairs may be lighted from above. The heating, and to a great extent, the ventilation, is accomplished by a system of combination hot water and hot air. Hot water radiators are distributed about the exterior walls of both floors, while the central portions are left to be aired by hot air. Herein is said to lie a solution of the house ventilation problem. With hot water alone, the contractors argued it was impossible to get a flow of fresh air throughout the building. It merely meant, re-warming over and over again the diluted atmosphere, unless the windows and doors were allowed to stand open for sufficiently long periods to usher in a draught of cold air, while with the hot air system the furnace demanded to be fed with fresh air, which must naturally become tempered and distributed through the radiators.

Complete, this residence cost approximately \$8,000.

University Scholarship of the Architectural League of America

HARVARD UNIVERSITY offers to members of the Architectural League of America three scholarships in architecture. These scholarships are divided into two classes—Class A. One scholarship which is restricted to those who can pass the entrance examinations of Harvard College. Class B. Two scholarships for special students for which there is no examination, but a competition in architectural design to select the holders.

Class A. This scholarship to regular students is for one year, with the possibility of reappointment for a second year, conditioned upon the record of the student made at the University. In order to pass the examination candidates should be graduates of a good high school or have an equivalent preparation. In June Harvard University holds examinations for admission in the principal cities of the United States. The entrance examinations for this year are held from June 22nd to June 27th, inclusive. These regular entrance examinations will be taken by Class A. candidates and the scholarship will be awarded to the student who passes with the highest standing. For a list of the subjects of the examination, the places of same for this year, and for other information regarding admission to Harvard College write for pamphlet to Mr. J. G. Hart, Secretary, Cambridge, Mass. This officer will, upon request, also send copies of recent examination papers.

Class B. Two scholarships for special students, each for one year, will be awarded upon the result of a competition in architectural design, on a program prepared by the Architectural Department of Harvard University. The competition in the various cities will be conducted by the League through the organizations affiliated with it, and will be judged by the Professor of Architecture of Harvard University and a Boston architect, selected by the League. Provision will be made for individual members of the League.

This competition will be opened by a preliminary sketch to be made on Saturday, May 2nd. One week will be allowed for making the final drawings. Directions regarding the conditions under which these drawings are to be made, their size and the manner of sending them will be issued later. These scholarships entitle their holders to free tuition in Harvard University during the periods stated above, the cost of such tuition otherwise being \$150 per year.

Further information may be had from the Chairman. The Architectural League of America also has a foreign or traveling scholarship, for information regarding which apply to Professor Percy Ash, chairman, Committee on Traveling Scholarship, George Washington University, Washington, D.C. Committee on University Fellowship, Emil Lorch, chairman, Ann Arbor, Michigan; A. G. Headman, Charles T. Ingham.

Novel Church Spire Construction

THE highest church spire in St. Louis, Mo., is being built in a novel way. Its pinnacle will soar 246 feet above the ground. It is the first grille work spire in America, the entire steeple being constructed of stone lattice, giving free play to heavy winds. Engineering applications in the construction of this spire are novel, as every piece of stone used in the steeple has been cut at the base of the tower by tools run by compressed air, and the same agency has hoisted the stones to the several stagings of the work. Pneumatic tubing is carried up the derrick to the successive stages. Stones weighing fifty pounds have been shot through these tubes to the workmen above and held in place by the air until removed from the tubes. The whole spire will be crowned by a steel cap, seventeen feet high, and several steeplejacks will be required to fasten it in place.

Fallacy of Municipal Ownership

BY W. MCLEA WALBANK, B. A. SC.

A Comprehensive Discourse on Government Ownership vs. Private Enterprise Showing the Impracticability of the Former and the Economic Failures Resulting From Past Experiments Which Have Been Productive of Many Evils. Public Control the Solution

BEFORE vacating the Presidential chair, allow me once more to thank you most heartily for the honor you did me by electing me to the highest office in the gift of this Society.

I am glad to be able to report the continued growth of the Society, whose membership not only covers the whole Dominion of Canada, but includes the United States, England, Africa, and even Russia. During the past year there have been added to our roll 477 members, so that we now have a total membership of 1,968, including associates and students.

I regret that we have recently lost one of our most distinguished honorary members: I refer to the late Lord Kelvin, G.C.V.O., O.M.P.C., the leader not only of English science, but universally acknowledged by the scientific world as its greatest physicist. To him we owe the laying of the Atlantic cable, the mirror galvanometer, the improved mariner's compass, the dynamic theory of heat, the siphon recorder, to say nothing of his various inventions for measuring the strength of electric currents.

The profession at large will regret the sad calamity that befell the Quebec Bridge, entailing such loss of life and money, not to mention the serious delay to the undertaking. Its failure was truly a national calamity. While it is gratifying to learn that no member of the Canadian Society of Civil Engineers or Canadian contractor was responsible for its design or construction, yet we must sympathize with all connected with the undertaking.

Through the kindness of the Deputy Minister and Chief Engineer of the Department of Railways and Canals, we were offered an opportunity of viewing the wreck. I am sure that all those who visited the site must have been struck with the excellent condition of the stone abutments and piers built by M. P. Davis, of Ottawa. Had I not examined them I could hardly have believed it possible that they could have withstood the crash, without showing effect. But they appear almost as perfect as the day they were finished, only a small portion of a projecting coping being broken.

The year just closed has given evidence of continued progress from an engineering standpoint. We have witnessed great railroad extension throughout Canada; the lighting, deepening, and improving of the ship channel from Montreal to Quebec; the development of water powers for the use and convenience of man, high tension-transmission of electricity from long distances—together with the improvement in wireless telegraphy, ocean greyhounds for fast Atlantic service; and the extended use of ferro-concrete in engineering works. The Detroit River Tunnel, connecting Windsor and Detroit across the Detroit River, for the Michigan Central Railway, deserves to have the special attention of engineers drawn to this interesting work, where two twenty-three-foot (23) tubes are being sunk sixty-five (65) feet below the level of the river, in a channel dredged for the purpose. The novelty of the whole scheme should make it specially attractive and worthy of the Society taking a summer excursion to the site of the works. There still remains the perfection of the flying-machine and the finding of the North Pole.

It is not my intention to review the progress of the different phases of engineering; time will not permit of

it; so I will follow the beaten path of my predecessors, and address you on a subject that I have been more or less intimately connected with, i.e.:

MUNICIPAL OWNERSHIP.

The Institute of English Bankers a short time ago attributed the widespread depression that existed in England at the time, to the engagement in municipal trading. They pointed out "That it had been productive of many evils, such as the elimination of personal initiative and enterprise, evasion of the natural laws of commerce, the creation of a favored class of labor. It has brought corruption in politics, and practically eliminated in many directions any further attempts to engage in private industry."

The country has been after the corporations recently to such an extent that we have become unnerved, tired of leading such a life, and seek rest. The losses in credit and value of money during the past year have been untold. Even those that have safety deposit boxes full of securities, through lack of credit are unable to obtain money to carry on their works, so necessary at this time of the year to give employment to those who will otherwise feel the pinch of hunger.

The recent panic was not a rich man's panic, not even an industrial panic; it was a financial panic, which every man, woman, and child is bound to feel the effects of. We have been attempting too big a business with too small a capital. As long as there was confidence and its resulting credit, a small amount of money accomplished wonders, but destroy that confidence, replace it with distrust, and a large amount of money accomplishes but little. There is not sufficient money in this country to carry on business if actual cash must pass from hand to hand. A short time since our industrial conditions were all that could be desired; but a spirit of unrest and discontent has appeared. The working classes are arrayed against capital. The professional agitator is seeking new recruits, and political interest knows no law but to succeed. Votes are gained, business may suffer, may even go to the dogs, but who cares? Corporations can be taxed; that is what they are there for. I do not wish to be understood as saying that corporations are not in a measure responsible for this state of affairs. When we read of great railroads giving secret rebates, enriching the recipients and suppressing competition in the interests of individuals, of the enormous amounts of cash and bonds in the hands of insurance companies, of how large companies are promoted and their capital inflated by their organizers giving large bonuses of common stock to those who subscribe for its bonds—is it any wonder that labor rebels and becomes arrayed against capital?

Is their condemnation of wealth, trusts, and corporations justifiable? Have they forgotten that it is from these sources that the people at large have derived hospitals, colleges, museums, special chairs of learning, and other beneficent uses too numerous to mention? I think that a close examination of most gas, electric, and public utility companies will reveal the fact that the public and taxpayers in general derive more benefit than do the ordinary shareholders, whose money has made these possible. To those engaged in the management of electric and gas plants, it seems impossible that the clamor for the municipal ownership of these utilities, based on the theory that municipalities can produce these commodities as

[NOTE.—Address delivered before the Canadian Society of Civil Engineers at the Twenty-Second Annual Convention held in Montreal January 29-31.

cheap, or nearly as cheap, as the corporations, can be founded on fact.

You must realize that self-interest and the interest in getting returns on investments, point towards the economical management of large enterprises, and while we may not be beyond reproach or criticism, many of the so-called evils are the result of unwise legislation. Ill-advised efforts are made by governing bodies through legislative assemblies, to secure advantages over corporations that can only result in causing the investor to feel that his interests are being attacked, and causes him to resist such legislation, the result being a feverous agitation between the would-be perfectors of civic government and the owners of corporate properties, without either party reaching a satisfactory conclusion.

INCENTIVE TO DEMAGOGUISM.

If so-called reformers would only take the trouble to investigate carefully both sides of the problem, many of the supposed evils would disappear, and all they would have left to work upon would be the substitution of civic or political management in lieu of industrial management. The civic politician sees an easy road to office through catering to and fanning the flame of public discontent, to which "yellow journalism" has given birth. He sees votes and therefore shouts for municipal ownership indiscriminately. He never loses an opportunity in season and out of season of pointing out how wretchedly our companies are managed, and how extortionate are the tolls that are extracted from the public, compared with the rates that might be expected if Mr. Alderman had the management. He sees great possibilities of extending his patronage by an increased list of employees, and the expending of vast sums of money, while the average citizen thinks he sees a favorable opportunity to obtain a necessary commodity at a greatly reduced cost. Were a referendum taken, I have no hesitation in saying that the majority of citizens, unless they were property owners whose lands would have to pay the cost in taxes, would vote for free gas, free electric light, free telephones, free street railway service, free groceries, free coal, free newspapers—in short, all the necessaries of life free of cost.

In pointing out the fallacy of municipal ownership, Mr. M. J. Francisco, an engineer who has devoted a great deal of thought and study to the question, in his work on the subject says:

"The whole foundation of municipal ownership is based upon the assumption that inexperienced hired employees of a city who have not a dollar at risk, and in many cases have been given the position as a reward for helping some political aspirant to office, can and will run the plant and manage the business more successfully than the members of a private corporation, notwithstanding the latter may have all their property invested in the enterprise, and a failure means ruin to them. Is it not reasonable to suppose that men under such conditions will give closer attention to business and investigate every branch and detail of its work? It is a well established axiom that the more a man has at risk the closer attention he gives to details.

"It is well known that municipal ownership is purely and simply a political move to secure votes for some aspirant for office, and that it is used for this purpose regardless of any other question. Parties have publicly announced that they are using it as a plank upon which to stand while they gather in the votes.

"It has become a well-established principle with both parties that civic government is the lawful spoils of the victorious party. It is for the purpose of getting the votes of the laboring class that lower rates of taxation, with shorter hours and higher wages, are promised, but these are forgotten as soon as the election is passed, as was shown in Detroit and other places.

CONDITIONS IN GLASGOW.

"When the advocates of municipal ownership find themselves unable to disprove the facts disclosed under municipal management in this country, they immediately fall back upon Glasgow and the wonders achieved there by municipal ownership. The conditions are not the same in Glasgow as are found in the United States. The government is entirely different, and the political situation that exists in this country is not found there. Wages there are less than half those paid in this country. Conductors on street cars are paid 93 cents per day for the first year, and \$1.04 the third year, while conductors on street cars in New York are paid \$2.00 the first year and \$2.25 after that. The average wages for the railroad men in Glasgow are 78 cents per day, while in New York they are \$1.88. Here we have a difference of more than 100 p. c. in wages alone.

"Anyone who has travelled over the street railroads in Glasgow knows perfectly well that the whole equipment and accommodations are antiquated and behind the day, while the service furnished there would not be tolerated in any city in the United States. We are also told that the profits or revenue from the street railway in Glasgow is so large that it pays all the expenses of the government, while in fact the roads are not operated for the purpose of producing a revenue to meet current expenses of the municipality. Instead of there being no taxes in Glasgow, they are more burdensome than in this country. Rents are taxed 12 1-2 c. on every dollar that a man pays, and the owner of the property has to pay the same amount of tax. Besides this, license taxes are levied. You pay a tax for every servant you employ in the house, also on every horse or carriage; in fact, you cannot turn round without running against the tax collector."

What would become of electric light, telephone, street railway and gas plants, if these undertakings were in the hands of municipal authorities? Would improvements in these enterprises be encouraged or would they remain at a standstill? The whole question seems to me too simple for elaborate discussion. A Municipality should not be allowed to tax its citizens for its own benefit, but for the benefit of the whole and not of the few. Administration of justice, the protection of life and property, the police and fire departments, and civic affairs generally, such as the maintenance of roads and sanitary conditions, are things in which all the citizens are interested, and for which all should be called upon to bear their proportionate share of cost. We might go as far as to include water, as this commodity is needed by every person, rich as well as poor, for fire protection and sanitary purposes. It comes therefore fitly under municipal control, and at this stage I might say that if a private company were furnishing the water that is being furnished to-day to the city of Montreal, the citizens would rise up in arms. Would they accept unfiltered St. Lawrence or Ottawa river water for domestic use, receiving as it does the drainage of the towns between Toronto or Ottawa and Montreal, and at a price fully twice as high as it would be, were it under private control? My answer is, No.

The water works plant is undoubtedly operating at a considerable profit, and the city as a whole it is to be hoped is benefiting financially. On the contrary, were we to take the case of gas or electric light, if it is operated at a profit then the users of the light are paying the profit. If it is run at a loss then the municipality is carrying on a business which is not profitable, to the detriment of the taxpayers who are not using light.

HONEST SUPPORTER DECEIVED.

That there are many honest supporters of municipal ownership who have been deceived by the highly colored but false reports from cities that are experimenting with this question, is undeniable. It is only natural to suppose

that municipalities after having made large investments in municipal enterprises should endeavor to justify what they have done. They certainly will be reluctant in throwing the limelight on their errors in acts and conclusions. On the contrary, the tendency will be to suppress the bad and give prominence to the good, which is only to be expected, and this important question really gets serious consideration from owners of property only when the situation becomes acute or puts the taxpayers on the defensive.

The following analogy is taken from "Municipal Ownership":

"Aesop's fable of the fox and his lost tail here finds excellent application. The wily old fellow wished company in his misery, and, we recall, urged all the other foxes to cut off their tails. He gave as many favorable reasons as a proud possessor of a municipal plant can offer a sister municipality in urging her to do likewise. But the assembled foxes remembered that the loss of a tail is easily accomplished; that the troublesome thing is to get it back again. Municipal, like private, funds may be spent at any time—they take flight easily—with less ease one again gets possession of them."

Governments, federal, provincial, or civic, are instituted for the purpose of protection, not production. It would be just as reasonable for either of these bodies to enter any pursuit, such as bakers, grocers, saloon-keepers, or the insurance business, as it is for them to enter the field of public utilities, and

"Just so sure as a nation becomes a commercial producer, competing against its own citizens, just so sure will the seeds of its own disintegration be sown. There is no finality to municipal enterprise."

The character of a public service is to be judged as much by the extent of the service as by its cost. In other words, it is better to serve double the area and number of inhabitants at a given cost, than it is to serve one-half that number at half the cost.

Recent public reports from Glasgow, Edinburgh, Manchester, Leeds and Birmingham, show that they are operating a smaller number of lamps than Chicago alone, and very few more than Boston, while the combined population is a million more than Chicago, and fully five times that of Boston. If you take Glasgow, Hull, Brighton, Portsmouth and Swansea, you will find that on December 31, 1905, the number of municipal telephones was less than 20,000, while the number of private telephones was over 40,000. In 1905 the increase in municipally-operated telephones was 12.05 per cent., and in private telephones 92 per cent.

EXCLUSIVE FRANCHISES.

Exclusive franchises are not popular, but the best service at the lowest cost can only be secured in gas, electricity, telephones, or street railways, by one company having exclusive control within given limits. But in such cases, in order to protect the public, exclusive franchises should only be given under some sort of public control.

Mr. Allen R. Foot, Commissioner of the Ohio Board of Commerce, is quoted as follows:

"You want the best obtainable service at the lowest profitable price. It goes without saying that you cannot get that condition by dividing your demand between two or more corporations. The economies of production and distribution are not increased by the division, but by concentration. Therefore, the problem properly analyzed does not admit of competition as a factor.

"In the past record of this country, the whole effort has been to regulate public service utilities by competition, and all the complaints that are now being pressed, of discrimination in rates, and rebates, secrecy of accounting and over-capitalization, are the direct and legitimate results of attempting to regulate a business that is a natural monopoly by the principles of competition. Assuming the point of view that a business is a natural monopoly, then,

it must be controlled and regulated by principles to control monopolies. That means public regulation."

REPORT OF SYRACUSE COMMITTEE.

During the past year the city of Syracuse appointed a special commission to inquire into the lighting question, and their report was handed in on the 3rd of September last. The findings of the committee are adverse to a municipal plant, either for gas or electricity, and the following is quoted from their report, which is now a public document:

"The granting of a franchise which results in competition in electric lighting and power service is fraught with many grave contingencies. The inconvenience and annoyance of the public in having duplicate systems of poles and wires in the streets is sufficiently obvious, and it is not necessary to enlarge upon that feature of such a situation. Only most urgent necessity for relief from unsatisfactory service and excessive rates, and the failure of other practicable remedies, would warrant such a step.

"Duplication of electrical distributing systems increases the number of poles and wires in and over our streets, with consequent greater difficulty in contending with fires. The responsibility from accidents from crossed wires and defective construction is not so readily fixed when numerous independent systems of wires are in the streets.

"The division of the business between competing companies makes it less practicable to compel the use of underground conduits extensively, because competition renders the business less profitable to both companies, or if separate conduits are constructed, the disturbance of the surface of the streets becomes a more serious annoyance to the public.

"As against the possibility that the public might receive at least for a time better rates and service, is the other possibility (not to say probability) of an agreement being arranged between the nominally competing companies which would nullify the effect aimed at through competition. If we may draw deductions from practically all previous experience with such utility corporations, we may conclude that the outcome—should the Niagara Distributing Company actually have entered the local field—would probably have been either an agreement with the Syracuse Lighting Company to divide the business along territorial or other lines, or else a consolidation of the two corporations on some basis to their advantage rather than to the advantage of the public.

"The division of the business would probably not enhance the grade of service to individual users, nor reduce the rates for power or light. On the other hand it would naturally have the opposite effect.

"Merging of two companies would result in a larger capitalization on which the consolidated company would endeavor to pay interest or dividends. It would also naturally desire to recoup itself for reduced returns during the period of competition. We may conclude, therefore, that competition in itself is not to be desired in the electric lighting and power field."

COMPENSATION FOR FRANCHISES

You may have noticed in connection with public utility, franchises that certain civic rulers, and I may say the press, have publicly demanded from the companies certain percentages on their gross earnings, to be applied to the making of good roads, etc. Now, if the price for service is based on cost, it matters little to the companies whether they pay the percentage demanded direct to the municipality or not. If the public demand it why cannot the companies pay it, as it would simply be an added expense to cost? If they do not demand it, then the cost, and consequently the selling price, would be so much less. It then becomes a question whether the company is to be a

(Concluded on page 59.)

Characteristic Interior Decoration

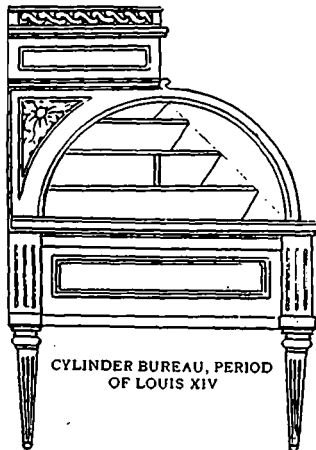
BY E. SINGLETON

Comprehensive Discussion of Classic Furniture, Draperies and Interior Decorative Effects of Noted Periods

IN order to determine to what period any given piece of furniture belongs, it is necessary to discover the distinctive lines that dominate the various periods and the characteristic ornamentation of each style. If this plan were followed fewer mistakes would be made, and no one would accept under that vague word "colonial" furniture of any style after 1776, when the various states ceased to be colonies.

The four French Louis are confusing to the uninitiated, yet, although the change of style is gradual, there are distinct features belonging to each period. Thoroughly to comprehend the Louis XIII., one must study the Henry II. and the Renaissance, for which we have no space.

Were we to enter a Louis XIII. room, the first points that would attract the eye would be the low ceiling, the casement windows with their tiny leaded panes, and the architectural and richly carved chimney-piece. Tapestry completely covers the walls. The bed is peculiar. It is a perfect cube encased in curtains of heavy material, which can be raised by means of cord to the top of the canopy, or let down to the floor, causing the bed then to appear like a large silken box. The four corners of the canopy are decorated with a pomme, or bunch of feathers. The chairs are also four-square, with low backs and generally with spiral legs connected with straining rails. The spiral also appears on the arm of the chair. The chairs are covered with silk or tapestry, velvet or leather fastened with large brass headed nails. In cabinets the architectural form dominates. Some of them are wider than they are high, and rest on a sort of a table with twisted legs; others are more monumental with broken pediment and prominent cornices.



CYLINDER BUREAU, PERIOD OF LOUIS XIV



CONSOLE-TABLE OF THE PERIOD OF LOUIS XIV, RICHLY INLAID AND DECORATED

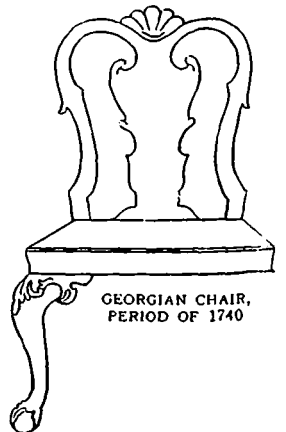
The characteristic ornaments consist of spirals; oval, convex cartouches; round balustrades; heavy big bodied vases standing on small bases; mascarons with chubby faces, heavy thick garlands, or swags of fruit or leaves; cornucopias from which fruit are falling; and square pane's framed by heavy moldings, and if the square elongates into a rectangle, it, like the cartouche, is placed with its greater length in a horizontal direction. The

great use of the octagon is also noticeable.

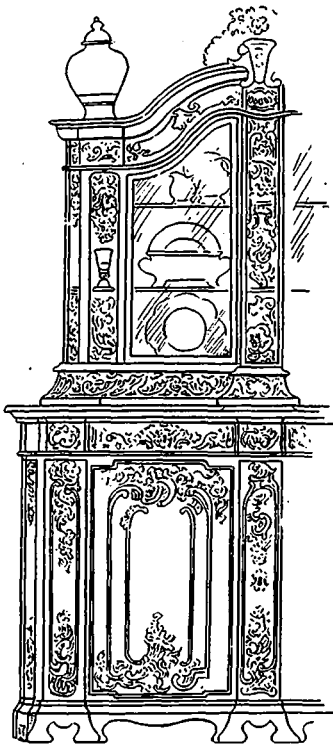
The Louis XIV. style is very imposing and majestic. Indeed, its splendor is so showy and dazzling that it is not hard to remember that the furniture of this period was designed to meet the taste of "Le Roi Soleil," "Le Roi Magnifique"—the warrior king—after his triumphs, and to adorn Versailles and Marly and other palaces of both royalty and nobility. The superbly carved and gilded framework of tables, chairs and cabinets, the marvellous Boulle commodes, armoires, consoles, tables and the like, with their rich inlay of ivory, metal and tortoise-shell, decorated still further with gilded mascarons, hand'es, key-plates, and other mountings; the handsome vases; the decorative candelabra; the handsome Gobelin tapestries, reproducing paintings by LeBrun and Van der Meulin, that adorn the walls; the rich silks and velvets combining boldness of pattern with brightness of color, used for hangings, draperies and upholstery; and the large mirrors reflecting these elegancies produce an effect of magnificence that limits the "Louis XIV." style to royal palaces, or houses of wealth devoted to formal entertainments.

In addition to the heavy splendors that suit a warrior's fancy, there is a growing interest in the East, and therefore in Oriental luxury and art-effect design and decoration. One has only to look at Jean Berain's arabesques to see the presence of Turk, Persian and Hindu. The prevailing forms are heavy, with a combination of straight line and curve. The arm-chairs and sofas have square seats and backs, richly upholstered; the only woodwork showing is the legs and arms.

The legs are usually term-shaped and are connected by heavy straining rails. The arms are formed of heavy scrolls, often ornamented with the Acanthus leaf. Tables are supported on heavy scroll legs or term-legs. The bed is richly draped and furnished with a canopy, but has only two head posts. It is placed with the head-board against the wall, which position is called "vu de pied." The cabinets and armoires are massive four-square pieces, the plain broad surfaces of which are specially designed for the sake of the ornate inlay of the period. Boulle, indeed, often uses the bombe, or swelling curve form; but generally speaking, the shapes are four-square and heavy. Gilded



GEORGIAN CHAIR, PERIOD OF 1740



LOUIS XV BUFFET, WITH GLAZED DOORS

The cornucopia has become stronger than during last reign, and its bell is more open. It often surrounds or supports the escutcheons or cartouches. The cartouche has a rounded convex field, circular or oval in shape and upon this field the coat of arms, the fleur-de-lis, or the two L's (the king's cipher) are applied. Sometimes the mascarons is used instead of the cartouche, and these masks are not infrequently the centres for ornaments—palm-leaves, ovolos, et cetera—are used for architectural moldings. The frequently employed garland consists of longer and richer leaves than the Louis XIII. garland. A very broad and full acanthus-leaf is also a favorite ornament. The materials used for hangings and upholsteries are tapestries, brocades and velvets; the latter particularly effective with their floral patterns. Gold and silver damask are also favorite materials; and among the new colors we must note the popular "aurora," "amaranth" and "canary."

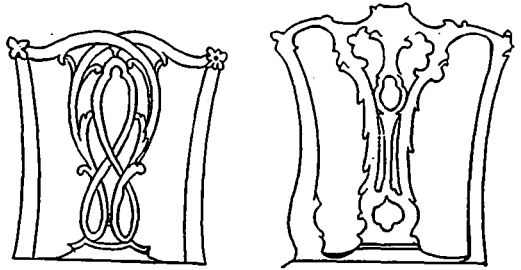
The second period of the Louis XIV. style is dominated by Berain. It is merely a delicate and more refined development of the first period, and almost without being aware of it, these are carried into the period of the Regency.

The Louis XIV. style insensibly led through the Regency into that of Louis XV. Long before the death of the "Sun King," French furniture had felt the influences of the Far Eastern trade. Mazarin was a collector of oriental curios and objects of art, and late in this reign the Siamese ambassador, with his presents, stimulated a taste for Eastern art. The "Chinoiserie" immediately became a fashionable fad, and monkeys were important motives of decoration in both carving and color with the artists of the Regency, as well as being pets of the *l'ouidoir*. The severity of the interiors of Louis XIV. gave

wood, carved by sculptors, now supplants the oak and walnut of the last reign and the carved mirror frame becomes more decoratively important.

In decorative art, the long reign of Louis XIV. must be divided into two periods. The first one, dominated by Lepautre, is heroic, or Roman in character. Trophies are a favorite ornamentation, consisting generally of a cuirass surmounted by a helmet and accompanied by swords and the victors' faces. Victory blowing a trumpet, river-gods leaning upon urns, and mythological divinities are also used.

way to the intimate comfort and elegance of the Regency and Louis XV. style, with their "petits cabinets," and the smaller pieces of furniture that had to adorn them.



CHIPPENDALE CHAIRS, 1764.

Straight lines gave way to the broken curves and rock-and-shell work, under the vision of new art revealed

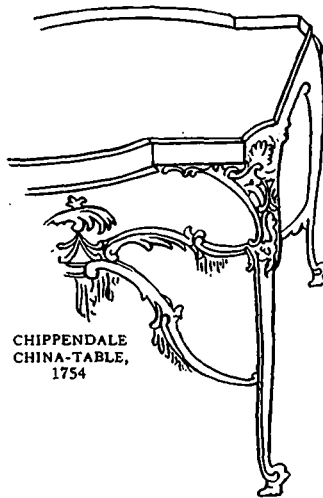
"On many a vase and jar
On many a screen and fan."

The panellings of the walls were broken up into delightful fantasy, and the designers of the time forced the furniture—chairs, sofas, bureaux and beds to correspond. The lovers of old severe school were powerless to stem the tide of decorative license. Curve and color predominated. With the advancing years of Louis XV., however, a chill seems also to have fallen upon the exuberance of the Louis XV. style, and the curves stiffen gradually into what is recognized as the Louis XVI. style.

Carving and gold lavishly applied formed a distinctive note of the Louis XV. furniture.

Louis XVI. furniture might also be regarded as a protest against the curve, substituting a coquettish simplicity for the "rocaille" of the previous period. The straight lines rule everywhere. The cabriole leg disappears entirely and the leg that takes its place tapers down to a point. For such articles as desks and cabinets and on chairs and sofas, it is often thick and squat, though pointed. The leg is frequently grooved and either inlaid with brass or gilded. The straining-rail no longer exists. One of the characteristics is the great use of the oval, which is egg-shaped, and this oval is often surmounted by a bow of ribbon. The discoveries made in Pompeii and Herculaneum created a taste for Roman and Greek forms, and with them some of their characteristic ornamentations; such as, for example, the lyre, the thyrsus, the torch, the quiver, the vase and the pinecone.

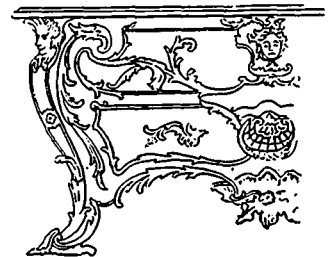
There is also another marked taste of the day—an affected fondness for pastoral life. The "Shepherdesses Trianon" were responsible for all sorts of simple field attributes, such as large straw hats, watering pots, spades, rakes, scythes and crooks, which often appear in combina-



CHIPPENDALE CHINA-TABLE, 1754

tion with the stripe and the interlacing ribbon.

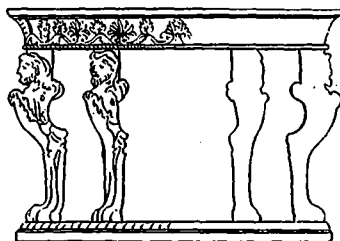
Just as the grooved leg, brightened with gilt or brass, persists in the furniture, the stripe persists in the textiles until about 1788 it becomes a passion. The



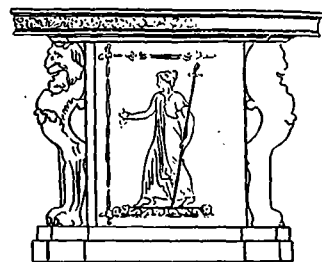
COMMODOE. STYLE OF LOUIS XV, 1750



SMALL EMPIRE CLOCK, DESIGNED BY PERCIER AND FONTAINE



EMPIRE TABLE, DESIGNED BY PERCIER AND FONTAINE



EMPIRE TEA-TABLE, SHOWING CHARACTERISTIC ORNAMENT

single plume or feather (a favorite of the Princess de Lamballe) is another popular device.

Among the ornaments, carved or inlaid, or appearing in the tapestries and printed silks, are musical instruments—especially the pipe, flute, and drum—baskets of flowers, bird cages, sheaves of wheat, knots of ribbon, garlands of leaves or flowers, wreaths of roses and the graduated fall of bell-flowers or husks inlaid or

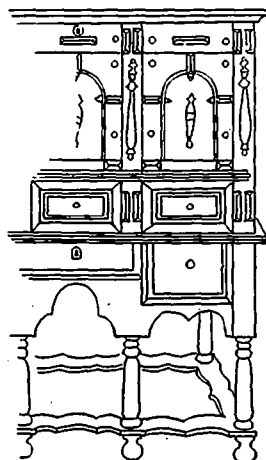
carved down the legs or palisters. There is a great fondness for inlay during this period and also for the use of brass rails on the tops of furniture, brass grooving and brass moldings. Richly chiselled brass mounts are also a feature of the style.

As in all other periods of decorative art, the first waves of the coming style—the Empire—are seen approaching while its predecessor—the Louis XVI.—is at its height. The designs of De Lalonde, especially show the direction that taste is about to take. De Lalonde continued to design during the Directoire, and leads up gradually into the Empire style. "All things were changed with the boudoir, which was transformed from a home of frivolity into a political cabinet, and with the drawing-room, which became a place where the young men read the newspapers, instead of paying elaborate compliments," says an authority. Therefore this dull and cold atmosphere of the Directoire period, with the guillotine hanging over everybody's head, was inevitable. All bright colors and all rich textiles are foresworn. The walls are no longer decorated with amorous mythological beauties and scenes of gallantry, but in their place are portraits of the Republican heroes of the destroyed Bastille on a background of dingy gray or reddish brown, with perhaps a frieze en grisaille, or simple ornaments of Pompian origin. Posts are restored to the bed and are often antique fasces supporting axes or lances. All the furniture follows the coldest and severest lines of Greece or Rome. The tripod the altar, and the sarcophagus are felt in everything. The chairs and couches on which the Incroyables lounge are upholstered in the hardest manner. The ubiquitous urn even decorates the stove. The furniture is made of mahogany, or painted or bronzed. Curtains are negligently thrown over an arroy or Thyrsusfor cornice, lambrequin and festoon have departed with the rich silks and damasks of the past.

The Directoire style is therefore a transitional one, from the Louis XVI. to the Empire, which undoubtedly would have developed even if Napoleon had not become Emperor. The style was exactly suited to the military hero and his rigid ceremonials. David, the painter, inspired the arts, and Percier and Fontaine the forms of furniture and general decoration. The lines of the tripod, the altar and the sarcophagus still persist; and to these the military attributes of the hero are added, and the Sphinx (already used in the period of Louis XVI.), becomes conspicuous as a memory of the Egyptian triumphs.

Yet in all these forms it is plainly noticeable that the mission of furniture in the Empire period is subsidiary to decoration in a room. The metal mounts or bas-reliefs that adorn every piece of furniture, and sometimes the woodwork of the wall, are delicately chiselled and gilded. The ornaments thus applied upon the wood are chiefly rosettes and allegorical figures. The legs of the tables, and such, are no longer fluted or grooved, but consist of a simple column of wood with a gilded Doric capital. The Sphinx, the fasces, the laurel-wreath and the swan are also characteristic devices. Herdes of antiquity usurp the place of mythological deities. Mahogany is used almost to the exclusion of every other wood. Notwithstanding the brightness of the metal trimmings, the general effect of the Empire style is a cold and forbidding stiffness, which is chiefly owing to the massive, cubic and rectangular forms, which are devoid of projections or carving.

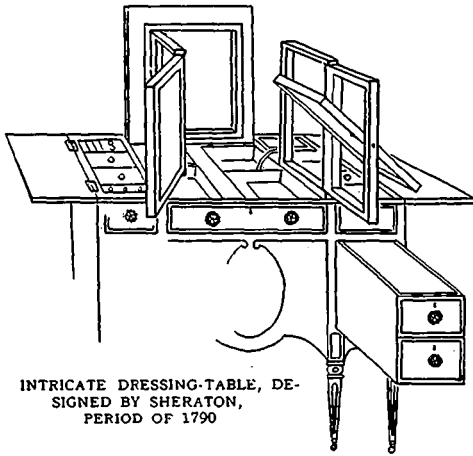
The course of English furniture is very readily followed and understood when a survey has been taken of French design and Dutch interiors. In studying English furniture subsequent to the Tudor period, the importance of the Dutch influence upon it can hardly be overestimated. During the Elizabethan age, nobles, poets, and adventurers of all kinds trailed a pike in the low countries, and the mutual hatred of Spanish aggression brought the two protestant communities into closer sympathy and communication than they had ever been before. The Jacobean furniture is closely allied to the Flemish and the Louis XIII. styles. We find the same "drawing tables," carved four poster beds, chests, court cupboards, armories, and so on, carved or inlaid with the exotic woods lately imported. Late in the period, however, the heaviness of the forms disappears, and we have, instead of carved faces of heavy timber, turned stretchers and straining rails, spiralled or otherwise as supports to cabinets, tables, chairs, et cetera. The chairs become lighter and have cane panels in their high backs, and cane seats, and the lightness of the products of the East is making itself felt. This lasts all through the reign of William and Mary, who naturally brought in a great deal of additional Dutch influence, especially that of Marot, and all through the reigns of Anne and the first two Georges the influence of the importations from the Far East is distinctly noticeable. The Queen Anne style is a conglomeration—a mixture of Louis XIV. and the Empire style, brought into England and the



LATE JACOBEOAN CABINET, WITH APPLIED ORNAMENT

other countries by some of the best French artists and artisans who were driven out of France by the revocation of the Edict of Nantes.

In Holland and England they found a taste for Oriental goods, and tried to assimilate this taste with their own art notions. Porcelain, therefore, they made a prominent feature of interior decoration; china cupboards and brackets were especially designed for the display of ceramics. The Englishman who took the "grand tour" necessarily became acquainted with the new decorative arts that were being developed in Paris, and we find, on looking over the designs of French artists, many pieces of furniture and plate that were made for members of the English nobility. The result in the higher circles of London naturally was a demand for French designs. In the middle of the century Thos. Chippendale brought out a book of designs which has given his name to the new school of furniture. "Chippendale" furniture covers a very large field at the present day. Nevertheless, originally it was merely a series of designs from the contemporary French school, modified in accordance with an English craze for "Gothic" and "Chinese" ideals, to suit the prevailing taste. Some of his designs can be traced directly to Meisssonier, the shining light of the Regency. Many of his Chinese and Gothic cabinets and book cases are simply monstrous and



INTRICATE DRESSING-TABLE, DESIGNED BY SHERATON, PERIOD OF 1790

impossible; but his treatment of the old Anglo-Dutch chair, perforating and carving the splat and frame with rocaille details, has lasted till the present day as a masterly model for chairs and the Chippendale chair is unmistakable. Far rarer than his chairs, which have been so often imitated, are his overmantels and mirror frames, on which he lavished all the wealth of his craft.

Chippendale was followed by Ince and Mayhew and several other able cabinet makers, whose publications show the popularity of that style. However, the devotees of the Classical school were coming into power in England, as in France. The Adam brothers, who devoutly worshipped the "Five Orders" and made pilgrimages to ancient ruins to study the arts of the past, gained the ear of rank and fashion, and designed severe classic interiors of noble houses, with furniture to match.

The next name that claims attention in English cabinet-making is that of Sheraton, who had a great deal to say about furniture, but did very little actual manufacturing. His forte consisted in the intricacies of cabinet-making, the mechanical contrivances by which, for instance, he could make a ladies' toilet table contain in drawers and shelves more conveniences and surprises than the uninitiated would think possible. He also was somewhat of a pedant in the management of draperies, curtains and such, and devoted a great deal of attention to upholstery. After the French Revolution, the Empire had full sway

in England. The chief apostle of this school was Thomas Hope, who had a fashionable following.

Fallacy of Municipal Ownership

(Continued from page 55.)

public taxgatherer for the municipality, or whether the municipality should collect direct from the citizens, which to my mind is the only fair and just way, otherwise you compel a small minority of the citizens using the commodity in question to unfairly contribute to the city's revenue, while the benefits would be reaped by all.

REMEDIES.

Having reviewed the origin of the agitation for municipal ownership of public utilities, I will endeavor to point out my idea as to the proper remedies, and I would say right here that the remedy does not lie with the companies alone. It lies with the company, the consumer, and the public. There must be some give-and-take from the company, the authorities, and the public, or nothing effective will result. Public companies for their own salvation must endeavor to give the best service at the lowest cost. In my opinion the best results will be obtained by a system of public control. A "Public Service Commission," framed on the lines of the existing Railway Commission at Ottawa, would go a long way to protect the interests of both the company and the user. Reasonable inflation of capital is necessary to offset the possible loss or questionable profit. Fair treatment for capital invested in corporate enterprises is imperative. Capital is answerable to public opinion, which is oftentimes unreasonable and must be led, not disregarded. Rather educate the people in the fact that public corporations should have the same protection in the enjoyment of the rights to their property as is enjoyed by other investors.

PUBLIC CONTROL IN MASSACHUSETTS.

Massachusetts, U.S., has had a form of public control of private companies for the past thirteen years that appears to have given fairly good satisfaction. No doubt it also has its imperfections, and at times we hear of corporations and the public not being satisfied with its application in specific cases. On the whole, however, it has been advantageous. The consumers are better and more cheaply served, and employed capital is better protected. Stock-watering has been eliminated and reasonable returns on capital allowed. Badly-framed or viciously-applied laws could do serious damage, but with a real desire on the side of all parties to secure justice for all alike, public control offers a far better solution of all difficulties than does municipal ownership.

As I have stated, public ownership must endeavor to give the best service at fair rates, and the most satisfactory results will be obtained by following the lines laid down by the "London Sliding Scale," thus making the consumer a partner in the enterprise by reducing the price as rapidly as is consistent with sound management, and by treating the public as though they were its servants, not its masters. In all intercourse with the consumer or public, be it through the highest official of the company or its office boy, it should be the aim of the company to establish good feeling with the customer, even at the sacrifice of personal dignity. When the public appreciate that they are being fairly treated by corporations they will not object to fair returns on the capital invested.

So far as I can judge, the consensus of opinion of writers on this subject seems to be that some form of public supervision and control of charge for service by quasi-public corporations, offers the only solution of the problem.

"It preserves individual initiative, does not discourage enterprise nor the combination of private capital. It leaves industrial freedom unharmed, simply controls it in the public interest, enforces the rights of the consumers, while protecting the rights of industrial liberty."

Evil Effects of Competitive Tendering

By GEORGE C. NIMMONS

Showing the Inadequacy of Present Form of Contract, the Losses to Which Contractors are Subjected and the Baneful Influences of Rushing Work to Completion. New System Suggested

I DO not know of anything more important in connection with the erection of a building than the contract. Our interests all centre in this document, and by its terms we assume obligations which bind us all together for the accomplishment of a common purpose. There is perhaps no one who has a better opportunity than an architect to observe how well a contract accomplishes the purpose for which it was made. I, therefore, propose to discuss briefly the modern building contract and the effect which competitive bidding has upon it. We have seen in our time the greatest advancement in building construction, in some respects that the world has ever known. With the advent of the new building material, structural steel, and its accessories, the invention of the elevator, and the various things that have made this great progress possible, the problem of erecting a building has become one of great magnitude and responsibility. Yet, with all this advancement in construction, little or no improvement in the contract has come, or of the method of letting the contract, notwithstanding the fact that a contract nowadays may involve immense sums of money and great difficulties and problems of construction. Some contracts not only involve the execution of work in a manner never done before, and with which no experience has been had, and again some not only require great feats of construction in an almost inconceivably short space of time, but they may also be accompanied by unusual danger and even loss of life. With all of this to contend with, we make use of an old system of letting our contracts, which, in my opinion, may be questioned and discussed with profit.

Of the three kinds of building contracts, the percentage contract, the fixed-profit contract and the competitive bid contract, I will discuss the competitive bid contract, because it is the one generally used. Nearly all of the discussion which follows applies as well to separate contracts as to a general contract, but for the sake of brevity, the application is made only to a general contract. In considering, then, this important subject, I desire to direct your attention to several leading questions concerning our system of letting contracts.

PRESENT FORM OF CONTRACT INADEQUATE.

Does our present system of letting contracts by competitive bids result in securing for the owner the lowest obtainable cost for a building, consistent with good workmanship? On the surface of this proposition, it would appear that an owner always did get his building at the lowest possible cost, or sometimes below that by competitive bids. I suppose that most of you can cite at least one instance where you have suffered loss on a building through unfortunate circumstances over which you had no control, or through some other cause. Each time, however, that a contractor loses money on a job, makes him more conservative on the next building and makes him realize how full of risk and hazard a contractor's bid is. Consequently, the amounts allowed in an estimate for contingencies are much larger than they would be if there were not so much risk of financial loss. It is undoubtedly also the case that the various profits of sub-contractors and material men vary greatly in proportion and amount. It sometimes happens that the contractor will lose money and many of his sub-contractors make more than the average profits on the same job, and if one contractor or general contractor loses money, it does not follow that the building was built for less than the real

cost; that is, the actual cost, plus a reasonable profit for all contractors. In compiling the sub-bids which a contractor is required to get before making up his own bid, I do not believe that it ever happens that any one contractor ever succeeds in getting all of the lowest sub-bids that may have been offered on a particular building, nor does he succeed in getting them even if he gets the contract. As a result of our present system of letting contracts, there is scarcely a contractor who has not at some time in his experience been obliged to exercise the most rigid and severe economy, to the great displeasure and disapproval of his sub-contractors, who were in no way responsible for his signing a contract in which both he and they were subjected to loss. This has naturally brought about a condition in which most of the sub-contractors and material men have their particular friends and favorites, to whom their lowest prices only are given.

TENDERING.

The bidding on a large building involves the securing of prices on different products and materials from a great many sources. It may extend from the manufacturer down through the hands of many intermediate dealers, to the origin of the raw material. It may involve hundreds of people. All of these dealers and sub-contractors are obliged to expend thousands of dollars yearly in taking off quantities and making figures on plans from which they do not get a dollar in return. The amount of useless work done yearly in this country in that way must be an astonishing item, if it could be computed. The result of it all is, that the contractor and dealer add to their bids the expense of all this wasted labor and the owner pays for it. Here is a great waste going on constantly which increases the cost of building by reason of our system of competitive bids.

The amounts added to bids for contingencies are very considerable. Contractors must of necessity safeguard themselves in their bids, not only against troubles which may not occur with materials, but also against labor troubles, which are sometimes very expensive. The uncertainty at times of prompt delivery of materials by railroads, when time is the essence of the contract, often makes the purchase of expensive stock material a necessity. The lack of space to handle material in the congested part of a city, is at times a matter entirely problematical as to cost, and here again a contingency item must be added.

The extensive builders' equipment, needed for a modern building, cannot sometimes be closely calculated as to cost, on account of new and complicated forms of construction, which often occur in the construction of a building. These, and other causes of uncertainty in the cost of building construction, are usually allowed for by the contractor in his bid at a cost greater than what they actually amount to in the construction of the building.

MODERN COMPETITION COMPLEX.

The taking of competitive bids is a complex and intricate process. The theory of a sealed proposal is beautiful and the practice of it originally may have been ideal. But now, a sealed proposal is based on prices and information that may come from a hundred different sources, and the proposition is entirely different from what it must have been originally. The complications that may arise, the opportunities that may occur for loss for some and immodest profits for others, are very great. The very

nature of our system nowadays invites and encourages the opposite of that for which it was intended, and I firmly believe that the result of competitive bidding, as a basis on which to let a contract, does not, as a rule, result in securing the lowest possible cost for a building.

The undue financial risk and hazard connected with signing the average building contract are harmful influences which make themselves felt all through the operation of erecting a building. Of course, it is not denied that there is risk or chance in every business transaction. Risk cannot be done away with in building contracts, but it is very evident from the results of our method of letting contracts and from the great difference in the amounts of the bids, that an undue amount of risk is taken with the average building contract. The contractors themselves do not agree with any accuracy as to what the cost of a building is. The bids often vary several times the amount of the contractor's profit. The minute a contractor signs a contract for an important building, he assumes a responsibility far greater than the merchant or manufacturer does in his business. I believe the risk of a contractor for financial loss is far greater than was ever intended by that genius who first said "Competition is the Life of Trade." Competition in building is not that kind of competition; it is really speculation, and sometimes on account of the complication and difficulties of our modern construction, it is far more hazardous than buying margins on the Board of Trade. It is a gamble, pure and simple. When you think of it, and when you consider that the building industry was the first made use of by man, to build his shelter and home, and when you think that the building industry is the most important one of civilization, it does seem to be a great wrong that we, by the use of an antiquated system of competition, should make of this noble calling a gamble and speculation. There is no calling on earth that better deserves its reward than the building industry. Under our present system, a contractor, as a rule, is selected, first of all, on a basis of the lowest bid. Consideration of a man's integrity, his ability or character, have very little to do with it, if there is any great difference between the bids. With the architect present to police the job and see that nothing is missed, the owner is usually willing to fight it out along these lines.

EVILS OF RUSH WORK.

It is greatly to be regretted that this state of affairs exists, but it seems to be the only natural outcome of our system. When a contractor secures a contract under these conditions, his responsibility is very great, and on this account, his anxiety naturally has the effect of shaping his methods of procedure, all to one purpose. This has an evil influence on the work and on all those connected with the construction of the building. The effect of this unhealthy condition of affairs tends to preclude any thought of the permanency and excellence of the work, beyond that required in the contract. It extends to all the workmen and discourages thoughts or ambitions of good craftsmanship on their part. Who among the tradesmen have time to consider that a brick skillfully bonded at some critical place, might add years of endurance to a wall, or that a nail driven on a slant might hold a piece of lumber far longer in place, or that bit of paint added in some concealed place might make a piece of metal last twice as long? Why is it that the good, old-fashioned ways of bonding brick, such as our forefathers learned in England, have given way to the modern way of throwing brick into a wall, which often goes with hollow spaces and weak places in it, in spite of the most rigid inspection? Why is it that the old-time method of mortising and doweling timber, which went to make up the strong and rigid framework of our houses, has given way to the modern system of so-called balloon framing, where there is hardly a mortise or tenon to be found? What is it that is influencing our methods of construction,

and in some respects making them far inferior to the old-time ways? There is an influence from some pernicious cause doing this. It is not that our tradesmen are incapable; it is beyond question, traceable largely back to one cause, and that cause is competitive bidding. Competitive bidding allows no time under the contract for improvement in craftsmanship. All the skill, and all the art of the modern workmen are devoted to one and only one end and that is speed; speed at the expense of endurance or merit, or art in the work.

ARCHITECT AND CONTRACTOR MUST CO-OPERATE.

Another effect of our present system to be considered is the bearing which it has on the relation between architect and contractor. Under our uniform contract the architect acts as the agent of the owner and is supposed to furnish the contractor in the plans and specifications a complete guide from which to erect the building. The architect has conceived the building in his mind and drawn out this conception on paper, so that others may be able to translate the mental image into stone, or brick, or other material. The contractor and his workmen are supposed to be co-workers with the architect, working all together for the good of the building; first, to fortify it against time, its worst enemy; to build it economically, so as to make it best serve the purpose for which it was created; and to make it beautiful as a whole and in every part, so that it may take its proper place in the world as a welcome addition to the buildings of its time.

The architect, the contractor and all his men, should naturally be drawn closely together in a sympathetic bond of common endeavor, just as they used to be in olden times, when they made those beautiful carvings and did that exquisite workmanship, which we have never since equalled. If the characteristics of our people have been truly reflected in the nature of our architecture, then our buildings must be distinctly marked with evidences of the strenuous and economic commercial spirit of the times. Our greatest structures are *not* those dedicated to religion, art, or science, but to commerce. The greatest of all is the office building. Yet, if the signs of the times are read correctly, things are already changing and will change more in the future. As men acquire wealth and reach the stage of competency in their fortunes, they are beginning again to realize that financial supremacy and commerce are not the only objects of human existence. They are awakening to the fact that there are in the world other things of great intrinsic value besides money. There is surely coming a time when you, the builders, and we, the architects, will have an opportunity to create an architecture which shall at least be devoid of the narrow influences of our times.

In conclusion, I wish to make a few suggestions as to the cure for the evil effects of competitive bidding. I realize, I hope, as much as any one, the great difficulties in the way of making any radical change in a custom so long established, as competitive bidding. However, I believe that this system, which may have been all right in its day, has worn itself out. I believe that it is a misfit on our present day conditions; that our modern problems of construction will in time force it out of existence. To illustrate this, I wish to refer to the comparatively new problem of letting a contract for a reinforced concrete building. This new kind of structure may be successfully built with a reasonable degree of safety, provided that it is properly designed, and carefully and conscientiously constructed. Yet if any one of the many important parts of this building is slighted, or if the contractor, or even one of his workmen, undertake to apply any money-saving economies, or rush-methods of the ordinary building, the inevitable penalty is awful. The builder or the workman is liable to answer for it with his life. Here is a new feature in the problem that will surely receive a hearing

(Concluded on page 64.)

Fire Prevention and Other Things

BY F. W. FITZPATRICK

The Executive Officer of the International Society of Building Inspectors and Commissioner on Fire Prevention, Professional Inconsistency and Architectural Training

ANOTHER year has been wiped off the calendar of our lives. What have we done that has been worth while, and what would have been best left undone; what does 1908 hold in store for us, and how many of us will live to erase it from the calendar? Thoughts that naturally come to one at such times, and on the whole, thoughts that, at this particular moment, are not riotously pleasant. But perhaps the gloomy weather has something to do with that.

As far as business has been concerned, certainly 1907 has seen much building done and, all things considered, a much better class of construction than that which has been done formerly. More and better "fireproof" buildings have been erected than in any other year; people generally, seem to have displayed a slightly keener appreciation of what constitutes good construction, and the wildly speculative builder has been held in a little tighter leash. Several states and provinces have created the office of fire marshal with larger and more comprehensive duties than that office has generally carried heretofore. Some serious fires have occurred, but hardly any meriting the name of conflagration and, thank heaven, we have been spared anything of the awful nature of a San Francisco or Baltimore disaster. Collapses of badly constructed concrete and other buildings have not been so numerous, and experimental construction generally has been kept in hand nearly as effectually as has the speculative building of firetraps. Neither has, by any means, been stopped absolutely, but there has been a trifle less of both.

This, likewise, is a time for good resolves. Many of us wish we had done differently, in the way of financial investments, etc., at least, and are praying the God of Mammon to give us another show, firmly resolved to be wiser and more conservative. But that's neither here nor there. Money and hard times and all that sort of thing will bob up into one's mind, even when he is thinking about what ought to be done in construction—if there is any of it for us to do—in 1908. Let us all take a solemn pledge to do our utmost individually and collectively, towards fire prevention, towards the uplift of architecture as an art, and to do what we can to instill ideas as to what does constitute good architecture and sound construction in the minds of the people.

HARVEST OF THE FIRE FIEND.

I sometimes think that we ding so much at fire prevention, that people will grow tired of it and that the reiteration of our prayer will become a mere monotonous droning, much as is the liturgic litany of some of our good Christians, but, people have to grow familiar with a thing before they can get tired of it, and they certainly are not yet familiar with fire preventive measures or with the old, very old, causes that inevitably lead to the spread of fire. Pick up the technical fire reports of the departments or of the fire prevention societies and you will find in the description of nearly every fire such sentences as these: "Fire quickly spread via stairs and elevators"; "fire swept from story to story and in through the unprotected windows." In the daily papers the same thing is always given as a great discovery, as though it were something new for fire to travel via such routes. Here is to-day's paper with scare line comments about a hundred people just barely getting out of a store in Cincinnati, a fire panic, six people fatally or most seriously hurt in jumping from windows, etc., one killed outright and many firemen overcome, and "the fire originated on the first floor, but the elevator shaft created air currents

that quickly spread it to all the upper floors." And in New York thirteen people were lately burned to death in a tenement fire, most of them in the halls and upon "the wooden stairway that proved a means of communicating fire to the upper floors!" Wouldn't you think that men, even if they were not technically well informed, when they are constantly being provided with such illustrations as those, would have it forced upon them that open stairways and elevators constitute a menace to life, and that combustible materials are bound to burn in a fire? Wouldn't one think that even a child, endowed with only budding intelligence, would finally conclude that new buildings should be so built as to avoid all these things, and that the old ones should be so patched up and fixed that those existent dangers were minimized? But then Bernard Shaw says we are a nation of villagers, and upon my word I believe we are. We build as though we were, that is, many of us do; we handle our resources like a lot of bumpkins, and we do business generally in such a way that once in so every often, we are bound to get a terrific financial kick that makes us sit up and wonder what it was all about. No, until a very decided change for the better occurs, we must be convinced that people, even the architects, know extremely little about fire, and that it still continues to be a timely topic about which to preach.

FIRE PREVENTION TAKEN UP BY DAILY PRESS.

I have often remarked upon the changed demeanor of editors towards this subject of fire prevention. It used to be tabooed. Before the Baltimore and San Francisco fires they seemed thoroughly convinced that it didn't exist and fairly laughed at the idea of devoting valuable space to preaching against fire. But the daily press, the big weeklies, and even some of the old conservative popular monthlies have awakened and are doing some most excellent work in that field, not only in giving us (the old missionary preachers) all the space we want but in good editorial lambasting of the national stupidity and extravagance that permit of the awful waste. The thing becomes infectious indeed. After those great fires, we were listened to, at first impatiently perhaps, then with more and more attention until now fire data is actually being clamored for.

Of course, there are a few and even important journals that think the subject is not worth touching upon. For instance, a well-known American magazine has steadfastly declared that while its purpose in life was educational, and it was striving to help people as well as to amuse them, its editor has not yet seen that fire was of the slightest importance nor an economic problem that merited any discussion, and there was so much else of such infinitely greater interest that it could not possibly afford to give even a paragraph's space to tell its 600,000 readers that they should build better. Now then, I have the highest esteem for those people and personally some affection, but I do question their good judgment. Perhaps I am away off and not a competent judge, and therefore I am willing to mention that particular magazine by name, and I would like to hear others' opinions.

DEPARTMENTAL RED TAPE.

The other day I happened in the office of one of the high functionaries of the United States Government service and couldn't help overhearing a remark of his to a subordinate that was actually dumfounding to me. Said he: "No, we must not do it that way. That would simply

add more detail, more red tape to the work. It is all cumbersome enough already, and we should endeavor to eliminate some of that detail that now so clutters up the executive, functional working of the department that the prime purpose, the object for which the department really exists, is utterly lost sight of."

May we not hope for all sorts of good things and reformation in everything that needs to be reformed? I never heard anything like that before inside the sacred walls of a department. In times past there was so much checking of accounts and fiddling with details to see if the red lines on the bill, for instance, were spaced exactly according to rules and regulations and were of the proper thickness that no one had time to find out if the bill itself was straight and the goods or labor actually furnished the Government. Or, as a further illustration, if a piece of work could be done by one laborer in one day, it required the services of five clerks twelve days to arrange his time, fiddle with his vouchers, and pay him his \$1.50—the "executive functional" work actually costing more than the thing it was devised primarily to facilitate and accomplish. In other words, the tail has been wagging the dog. But after hearing that remark, I am so hopeful for the great, good things to come that I can hardly contain myself.

Those of us who have been at all observant must have noted an exceedingly marked improvement in government architecture both sides of the line in the past ten years. It used to be a travesty, a byword, with us, and I remember not so very long ago some of our architects would characterize anything that was particularly execrable as being *almost* as bad as if it had been done by the Government. But year by year has there been a steady improvement, until to-day it is no longer a question of the supervising architect's office and the P.W. office being "in it" with any office in the country, but I declare, all things considered, they are turning out a more consistent, a more continuously good (with fewer falls down) class of work than any office in the land, or in the world for that matter. Two of the last United States buildings, for instance, the Atlanta and the Des Moines, are veritable gems, architecturally, and have not been surpassed in appropriateness of conception, in handling of detail or in general massing by any of the late buildings of our accepted or past masters in the art.

PROFESSIONAL INCONSISTENCY.

What everlasting stupids most of our architects persist in being! I am thinking in saying that of the alacrity with which they rush into competitions, and the thought is suggested at this particular time by the outcome of a recent and quite important competition. It was an invited affair. There was an architectural advisor, judges and the other usual paraphernalia. And as usual again, the thing has ended in a mess. The judges' decision was rather questionable in the first place, and in the second place, it has been ignored by the awarding power and the work given to a non-competitor. I was talking to one of the owners the other day and asked him point blank how they had come to that decision. "Why," said he, "we had promised that job to so and so a year ago!" To my further amused inquiry as to why they hadn't given it to him outright and been done with it, he said that the architects had raised such a clamor about it and had been so very anxious for a competition that he and his associates had graciously yielded the point. "Those fellows were so overly anxious to compete that we let them have their competition," said he, and apparently quite sincerely and innocently, and without the slightest idea of having incurred any moral or business responsibility *vis-a-vis* the architects! The latter wanted to compete and they were permitted to do so: the owners wanted to give the job to a special one, and they did so. Everybody ought to be satisfied. True, it cost the architects about \$40,000 to thus play with themselves—but they *wanted to*. And that's the

esteem in which our holy and exalted profession is held by politicians, business men and laymen generally. If we only didn't *want to* so grovelingly, it might be different, but what's the use of harping? As long as some of us resort to the tactics of the pettifogging lawyer, who follows the ambulance to the hospital in the hope of beating up a damage suit against the street car company, just so long may we expect to receive the esteem and respect bestowed upon that caliber of legal luminary.

PRACTICAL ARCHITECTURAL TRAINING.

I would most strongly urge that our younger practitioners and students read in most receptive mood Mr. Barney's splendid article on the "Ecole des Beaux-Arts" in the November "Architectural Record." It is timely in the extreme, cleverly written and raps the nail squarely on the head. The average young man deems his architectural education incomplete without a fling at the Beaux-Arts. It *may* do him good; it has *spoiled* any number of naturally clever fellows. For my own part I know and have tasted the advantages and disadvantages of that training, but I also know that in the many years in which I have had more or less to do with the employing of draftsmen, that when a chap has come to me fresh from the Beaux-Arts, I want none of him until he has spent at least a year or so in some other American office and has had some of the frills and furbelows and idiotic notions bootied out of him. Read that article, it tells you what I mean and what I would like to say better than I can put it myself.

The perniciousness—I can't think of a milder term—of the training is evident in so very very much of the work we are doing. The *axis*, for instance, is a relic of that training. Now then, I love to see a certain amount of balance in a plan, but I oftentimes wish the *axis* to Hades and back again. The average draftsman begins his plan with that confounded "axis"; he has either been trained to do so at the Beaux-Arts or has seen some product of that institution begin his plans so. If it seems proper to put a stairway on one side of that axis, he will have to plan another one on the other side in the same relative position or his plan is nil. There is no more need of two stairs, mayhap, than for a cat to have two tails, but there is the *axis*!

Our art commissions and city improvement people are doing the same thing. They try to plant an axis down on a city. Supposing the natural conditions, or the growth of the city, or to reach some particular monuments or buildings, it becomes desirable to run an avenue diagonally away from that axis, you must immediately get to work and fix up a similarly diverging avenue on the other side. Never mind if it don't go anywhere, or if it passes through a river, or costs millions to attain, there it ought to be because the axis, the academic frill. There is no other reason for it; driving or walking through the city you will never stumble on to its *raison d'être*; it looks pretty on a plan, and mayhap when we get to using balloons it may dawn upon us, the why of the whiciness, but meantime, and as vociferously as I can, let me reiterate "hang the *axis*!"

DEVELOPMENT ALONG USEFUL LINES.

I was much impressed with a number of illustrations lately published of the work that is being done in the architectural class of the Washington University at St. Louis. Those compositions are particularly good, away above the average of students' work, and the rendering of the drawings most praiseworthy. Who says that the West is not turning out as much talent as the East, and who says that that new world talent, the Eastern and the Western and the Southern and the Northern, is not equal to that of any other land? And why spoil it by grafting upon it exotic and decadent ideas of foreign growth?

To all our schools, however, I would respectfully reiterate what I have so frequently suggested, and that is,

that they keep their themes in a sometimes minor key. Their students will not be called upon very frequently to design great theatres or art schools or court-houses. The most of them will have to plod along year in and year out on business buildings and still more of them on houses. So why not drill the youngsters in those lines so thoroughly that they will excel in them and not feel that they are wasting their time upon them and are unappreciated and couldn't do so much better with a court-house or a capitol or some major problem? Drill the boys by all means, in twenty-five foot fronts, seven story stores and apartment houses and \$10,000 homes that can be built for \$2,340.16. Let them wrestle with buildings 160 feet deep and light front and rear only. Put them up against the actual problems they will run against later on. Of course, give them a holiday once in a while, a feast, a broussing in the heights, on the mountain tops, but get them so that the diet of the lowlands will set well upon them and, incidentally, that they can do justice to it, too.

ACOUSTICS AN IMPORTANT ELEMENT.

Things certainly do run in sort of cycles and by spells. Just now, and for no particular reason that I can see, a great number of plans of churches, halls, etc., are being sent me by building committees to be passed upon and revamped to insure the good acoustical qualities of those buildings. This onslaught has made me think more on the subject and pay greater attention, and in fact, special attention to that matter when I go into such buildings, and, even more, has inspired me to make many inquiries among architects. And it is really surprising to note how little is known upon the subject. Its chief essentials are as tangible, as non-varying and constitute as exact a science as sanitation, or construction itself. Yet I doubt if one building in a thousand is planned with anything of that kind in mind. If the acoustics are all right it is purely and solely a lucky accident. And as far as any study of the subject is concerned, the average architect is as innocent of it as the babe unborn. You ask him why and he shrugs his shoulders and says it is out of his line.

Evil Effects of Competitive Tendering

(Continued from page 61.)

at the letting of the contract. It will soon become evident to the public, if it is not already so, that competition only on the basis of cost cannot with safety be entertained for a concrete building. Those sterling qualities of character in a builder on which so much depends for the excellence of the work, will receive a new and higher appreciation. A builder's ability, his integrity, his loyalty, his skill, his aptitude for his work, will again be put at a premium as these qualities used to be in olden times. When I refer to the concrete building, I have in mind not only the concrete building familiar to us with the ordinary slab, or floor beam construction, but those wonderful constructions in Europe, where astonishing things are done with concrete, both structural and ornamental. These great problems will undoubtedly come to us, and then the contractor will be called upon to execute the most difficult work that has ever been attempted. His ability and his skill will then be even in greater demand than they are now, and the best man will no longer be selected by competition on price. However, this instance of the concrete building was given in this connection only to show that the character of this work is such, and the danger of accident so great, that an owner and, therefore, the public will find that competitive bidding is not a safe way to let the contract for a concrete building.

SOLUTION OF PROBLEM.

In considering the remedy for the evil effects of competitive bids on contracts, it is evident that a very radical change must be made if any great good is to result. To

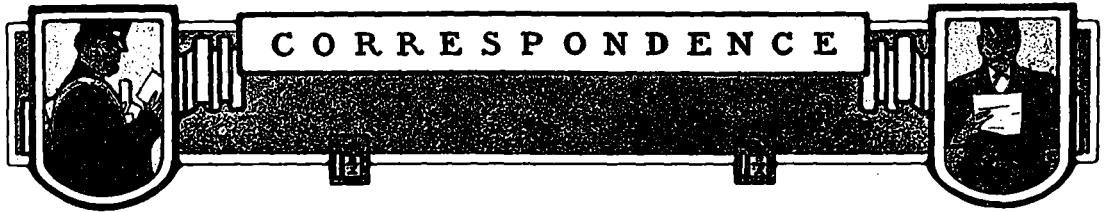
suggest a scheme which would in itself be radical and at the same time effective, is a very difficult problem, and it is likely that if an improvement comes, and I surely think it will, that it will come about gradually. It is necessary, first of all, to educate the mind of the public and to bring it to understand that there are a great many defects and evil results in building operations from our present system. I believe the difficulty would be largely overcome, if the problem of determining the real cost of a building, beyond question of a doubt, could be worked out. The fact that contractors' bids for the erection of every building differ so widely in amounts is a feature which has made the public regard the estimate for every building with suspicion. I understand that in England, where the estimator, called a "Quantity Surveyor," who is independent of the contractors, takes off the quantities of materials, that the bids of contractors, based on these estimates do not differ nearly as much in amount as do the American bids. I am informed that there is very little difference indeed between the bids of English contractors, as based on these estimates furnished by the "Quantity Surveyor." I do not believe that there is a single owner about to erect a building who would not be willing and glad to enter into a contract with any good contractor, and pay him a reasonable profit on all work done, if the owner could be assured, beyond a doubt, of the real cost of the building. On the other hand, I do not believe that there is a single contractor who would not be glad to undertake any ordinary contract, provided he was assured also of a reasonable profit. I believe firmly that these are the facts, and if they are, the problem would seem one of getting these two parties together on the proper basis.

A SYSTEM SUGGESTED.

Following out this line of thought, I have taken the liberty of outlining a system which I believe would meet the requirements in a general way. However, I wish it understood that this is given merely as a suggestion, with the hope that some of you, who are better qualified than I, will some day start the movement for a reform, which is so much needed in this part of our work.

The outline of my suggestion for a system of letting contracts is as follows:

- 1st. To establish some way of determining the absolute cost of a building.
- 2nd. To have the estimate of the quantity of material and labor made by some one independent of the contractor.
- 3rd. To have you, gentlemen, the estimators, set up offices of your own, as the English Quantity Surveyors have done, but estimate not alone the quantity of material as they do, but the quantity of labor as well: you to receive your pay as they do, by getting a percentage on the cost of buildings, and to be appointed as the estimator for a building by the owner or architect.
- 4th. The contractors to agree upon, as their profit, a reasonable and proper percentage, on the cost of buildings, and to execute a contract as they do now by hiring all labor and buying all material. Each sub-contractor in the various building trades to take his work on a regular percentage of the cost of the building: either separate contracts, or a general contract to be let for the building, according to the wishes of the owner.
- 5th. A definite fixed sum as the cost for the building and of each part of the work as estimated by the independent estimator to be agreed upon by the owner and contractor or contractors as the proper cost for the building, or the several parts thereof. This sum or sums to be made a part of the contract, or contracts. If, in executing the work, the amount of labor or material, or both, exceeds in cost the amount or amounts named in the contract, this excess of cost to be borne equally by the owner and the contractor, or contractors. If the cost of labor and material is less than that agreed on in the contract, the money so saved should be equally divided between the owner and contractor or contractors.



Registration of Architects and Non-Practitioners

Editor CONSTRUCTION:

With regard to the "Registration of Architects" in Ontario, being situated a distance from Toronto, where architects are more thick on the soil, and out of the circle of those who agitate for "registration" in some form, I am only brought in contact with this piece of legislation through your admirable paper making its appearance here. I am anxious to safeguard my interest as an architect who has had considerable experience in England previous to locating in this district, and not yet having put up my shingle designating to the public the profession I have so much at heart. I am anxious to know how the proposed law is going to affect one in my position.

In England I was articled to a first-class architect, and as time went on I became chief assistant to one of the leading county architects and surveyors. Later I served in a similar capacity to an architect of very good standing, carrying out some of the largest jobs in the east of England. Embarking in business for myself, I worked hard for three years, after which time, competition being extremely keen and a depression in trade prevalent, suggested my coming to Canada.

Here I have experienced the vicissitudes that a "green-horn" must expect in a new country, until now I am acting as draughtsman to an engineer in this district. I see good opportunities for a responsible architect, and feel as though I would like to again captain my own ship. The question is: Should I not be fortunate enough to get my "shingle" out some time this year or before "Registration of Architects" becomes law, would I be expected to pass an examination before being able to practice for myself, while a great number of present practitioners with absolutely no knowledge of architecture but fortunate in possessing a "shingle" would be permitted to carry on business and therefore have the advantage over such unfortunate individuals as myself?

What action on my part would you recommend to insure me being included within the "Registration Act" should it be enacted into a law before my opportunity comes to open an office of my own?

Also, what would constitute an "Architect" under the new law? I take it for granted that any man, whether architect or not, who happens to have his sign out prior to the passing of the bill, would in the eyes of the law be recognized as an architect.

Yours respectfully,

J. C., Fort William, Ont.

As to the exact nature of the provisions of the bill, we are unable to state definitely. It is, however, the purpose of the Ontario Association of Architects to have a law passed for the Government examination of architects under much the same conditions as now obtain in the Ontario Architects' Act. The clause which refers possibly more particularly to your case reads as follows: "Architects who have not requested or passed the examination as prescribed by the Association, but otherwise satisfy the requirement of the Ontario Architects' Act, may be admitted without passing the examination prescribed for students, if the Council, after taking such steps as may be necessary to satisfy themselves as to the qualification of the applicants, are agreed as to their fitness."

It is altogether probable that if legislation is granted of the character petitioned for by the Ontario Association of Architects, a Provincial Board of Examiners will be provided for and all practicing architects at the time of the passage of the law, will be admitted without examination, and other architects who are not thus registered may be admitted without examination provided the examining board is satisfied as to their fitness.

From the nature of your experience as outlined in your letter we believe that you will have no difficulty in obtaining a certificate of "registration" without an examination, if the proposed legislation is granted. In the February number of CONSTRUCTION you will find the condensed proceedings of the late Convention of the Ontario Association of Architects, which contains the reproduction of the proposed Act and considerable discussion on this subject by members of the Association. For additional information regarding legislation of this character, see November issue, page 34; October issue, page 18; January issue, page 39.

CONSTRUCTION.

United States Engineers and Canadian Work

Editor CONSTRUCTION:

I should like to enquire if there is any law which prevents the employment of United States consulting engineers in the Dominion of Canada on work done by Canadian owners? In the fall of 1904 there was some discussion and hard feelings about the employment of United States engineers on the Transcontinental Railroad, and some legal questions were raised at the time bearing on this point.

It is of interest to me to know if the Canadian laws permit United States engineers to be employed on Canadian work.

Yours very truly,

A. P. M., Boston, Mass.

The trouble which arose over the employment of United States engineers on the Transcontinental Railroad was due principally to the fact that it was Government work. The only law in Canada that would be operative in debarring United States engineers from doing work in this country is what is known as the Alien Labor Law that is framed very much after the same style of law that is in force in the United States. This law forbids the employing under contract of foreign labor, either skilled or unskilled. There is no special law that applies to consulting engineers. Several large American architects have designed and superintended the construction of many of the largest buildings in Canada. It is, however, the practice of American engineers and architects, doing business in Canada, to employ as a consulting engineer or architect, one who is a resident of Canada.

Canadian Cement Users Association Suggested

Editor CONSTRUCTION:

In view of the general use to which concrete is being employed in the Dominion, and the universal recognition it is meeting with in construction work, don't you think the time is opportune for the different branches allied to this industry in Canada, to organize an association along

similar lines to that of the National Association of Cement Users now existing in the United States?

This association has accomplished more than everything else combined in advancing the cement industry on the other side of the line, and the rapid strides which concrete has made in the States evinces what can be done in Canada with an organization of this kind. I really believe that those engaged in this work in the Canadian field fully appreciate the need of an association of this character. In my opinion all that is wanted is for some to take the initiative and after that I am convinced the formation of a national body in the Dominion would rapidly assume definite shape.

However, in this respect it would be advisable for the more prominent manufacturers and engineers identified with this work to take the first steps in order to give the enterprise the proper impetus at its very inception. While a Canadian organization would not have the numerical strength of the Association across the boundary, nevertheless its influence would be just as far reaching and its benefits as great. With its existence we could look for a broader development, a better understanding, a mutual exchange of ideas, and a higher standard of work in each and every branch. I think a journal like CONSTRUCTION is the proper medium to bring this matter to the attention of those engaged in cement work in the Canadian field. If you would touch on the subject editorially I think it would create a tendency among them to take an active interest in developing this project.

Respectfully yours,

SUBSCRIBER,

Winnipeg.

Toronto, Feb. 23, 1908.

Condemns Moving Picture Resorts

Editor CONSTRUCTION:

I have just read with no little interest your timely editorial in the February issue, regarding the Boyertown theatre disaster, in which is pointed out the grave dangers that are possibly lurking in our midst, owing to a lack of adequate protection against fire in many of our amusement resorts. The amazing rapidity with which moving picture shows and kindred enterprises are multiplying on the main thoroughfares in our cities only serves to bring this fact more prominently before the mind of anyone who has given the matter mature thought.

What is there to prevent a repetition of the Boyertown disaster occurring in any of these places? Surely the method of transforming a store-room into a pseudo theatre, over night, cannot embody the essentials of fire-proofing that would insure the safety of patrons who frequent them. Most of these places are walled in by structures on both sides and are therefore not provided with the necessary side exits. In event of fire or panic it is impossible to conceive how the audience could reach the outside without a number of persons being injured and the loss of human life. If a structure like the Ironous theatre in Chicago, far better equipped for contingencies of this kind, can be the scene of an almost unparalleled holocaust, what can be expected in the average moving picture resort?

But, aside from this unwholesome phase, why are these places permitted to intersperse our business buildings and convert the main arteries of trade in our principal cities into veritable "Midways"? It cannot be that the entrances of these places with their lawdry effect and blaze of incandescence, enhance the retail districts, and surely the mechanical thumping of the automatic piano and monotonous barking of the attendant is not sufficient to sway the emotions of the passing throng or soothe the irritations of the business hour.

Mind you, I am not averse to moving picture resorts, providing they are properly housed with sufficient exits, and altered in a manner that will absolutely preclude the

possibility of danger to those who frequent them. However, they should be removed to the side streets, and civic pride should revolt against these places adorning its principal business thoroughfares.

Complimenting you on the attitude CONSTRUCTION has taken editorially in its effort to provide Canada with a better and safer class of building and trusting that you will continue to emphasize the necessity of these structures. I am,

Respectfully yours,

J. F. C.,

Montreal.

Praise From the West

Dear Sirs,—Please find enclosed money order for amount of \$2.00, for which please forward to my address for the year 1908, CONSTRUCTION Journal issued by your company.

Having received two copies of this bright journal, I take much pleasure in stating that, in my opinion, it is thoroughly up-to-date and by far the best journal covering this field, which it has been my privilege to receive in Canada. I trust you will continue to keep up the high standard of this publication in the future.

Trusting you will forward this on to me, believe me,

Yours respectfully,

(Sgd), W. M. Dodd,

Architect.

Regina, Sask.

More Than Pleased

Editor CONSTRUCTION,

Dear Sir,—I have received several numbers of CONSTRUCTION, and must say that I am more than pleased with them. If you go on as you have started out, the venture should be a success. Wishing you the compliments of the season, I am,

Yours sincerely,

JAS. S. RUSSELL,

Architect.

Stratford, Ont., Jan. 1, 1908.

One of the Best of it's Kind

Editor CONSTRUCTION:

We are in receipt of some sample copies of "CONSTRUCTION" and are much pleased with the publication. We consider it one of the best journals of its kind we have yet received. Herewith we enclose subscription price (\$2.00) for one year. Thanking you for your kindness in forwarding specimen copies, with apologies for the delay in acknowledging their receipt. We are

Very truly yours,

BUTLER & MACDONALD,

Architects and Superintendents.

(Signed) J. M. Macdonald.

St. John's, Nfld., Feb. 22, 1908.

A Big Step Forward

Editor CONSTRUCTION:

We beg to acknowledge your letter of the 19th inst., and to inform you that we will be pleased to notify you in regard to any work of sufficient importance on which we are calling for tenders or contracts that have been let.

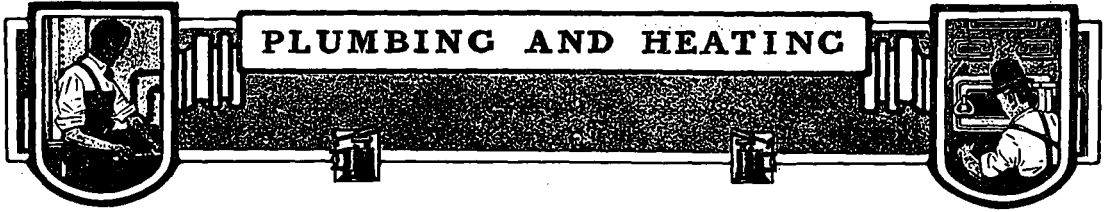
We also wish to compliment you on the production of such a creditable journal, which is a big step forward in Canadian Technical Literature, and to wish you all success in a venture in which you have shown courage and foresight.

Yours truly,

PRATT & ROSS,

Architects, Structural & Civil Engineers.

Suite 48, Aikens Block, Winnipeg Man., Feb. 24, '08.



Single Pipe Gravity System

BY MARTIN J. QUINN, CONSULTING ENGINEER

A System of Piping Which Has Replaced the Two-Pipe System in the Construction of Steam Heating Plants, Owing to a More Accurate Knowledge of the Amount of Water Due to Condensation in the Steam Mains

WE have discussed in a previous article some of the principles underlying the successful construction of the steam heating system, and we have endeavored to trace the connection between some causes and their effects in the case of systems where difficulties have been found.

What has already been said, has, we feel, been sufficient to make it apparent to the ordinary observer that the presence, in considerable quantities, of condensation in the mains or branches of a system, will be sufficient to create a great deal of trouble, but at the same time we desire to point out that the amount of water resulting from condensation is very much less than is usually supposed.

Because of a misconception respecting the amount of water which had to be handled in this way, it was customary, until comparatively a few years ago, to install

has its uses, which will be later illustrated, it has been almost entirely discarded, and replaced by what is known as the single pipe gravity system.

When it is understood that the condensation is only as one to fourteen hundred of the steam used in the operation of a plant, it will readily be understood that it occupies but a comparatively small percentage of the total area of the steam mains, and while it is advisable to use mains one size larger in a one-pipe system than would be found necessary in one of the two-pipe variety, the writer has repeatedly experienced good success while paying no regard whatever to the condensation which has to be handled by the steam mains, particularly where the latter are supplying large systems, and consequently are of larger diameter.

It is, however, necessary to provide large risers, and connections between the latter and the mains, for the rea-

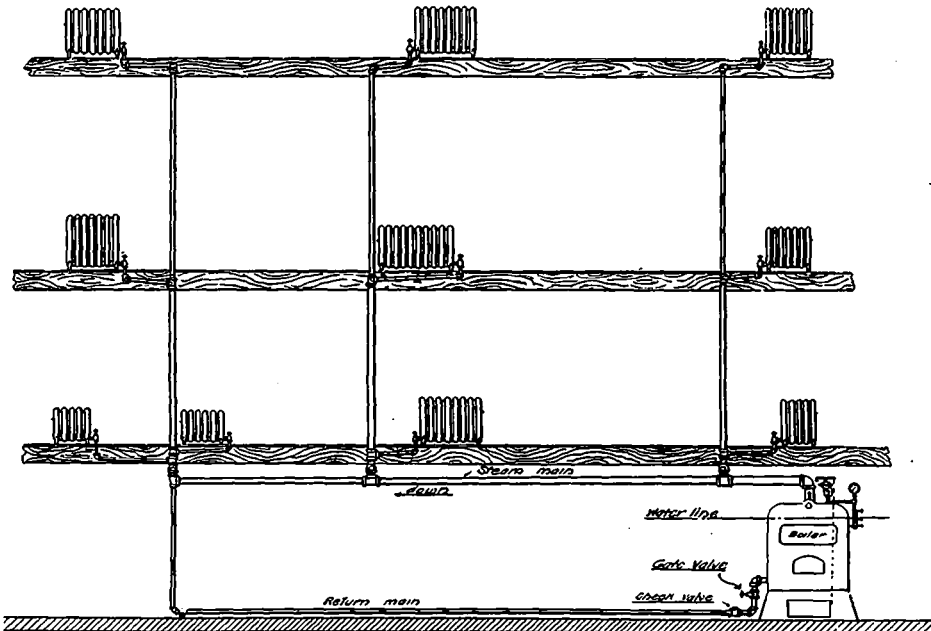


Fig. 1—SHOWING A SMALL SINGLE PIPE STEAM SYSTEM HAVING TEN RADIATORS. THE STEAM MAIN REACHES ITS HIGHEST POINT IMMEDIATELY ABOVE THE BOILER, AND FALLS GRADUALLY UNTIL IT IS CONNECTED WITH THE RISER MOST DISTANT THEREFROM.

what was known as a two-pipe system, which is, as is well known, provided with a set of mains and risers for taking the steam to the radiating surface, and another set, separate and distinct in every way, for taking the condensation back to the boiler, and while this system still

son that in the case of this portion of the piping the steam and water are travelling in opposite directions, and in opposition to each other, and it is particularly necessary that all horizontal branches should have ample capacity.

In Fig. 1 is shown a small single pipe steam system, having ten radiators, which illustrates generally the proper method of erecting such a plant. It will be seen that the steam main reaches its highest point immediately above the boiler, and falls gradually until it is connected with the riser most distant therefrom.

With respect to the amount of "fall" necessary in this case, it may be said that about three-quarters of an inch

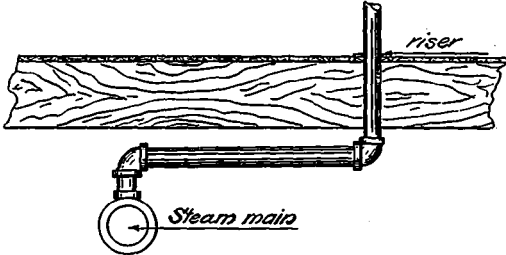


Fig. 2—SHOWING THE CONNECTIONS TAKEN FROM A MAIN TO THE RISER, THE HORIZONTAL PIPE BEING AT LEAST ONE SIZE LARGER THAN THE RISER.

in ten feet is good practice, but if it is just off the level, it will be found to give almost equally good results.

The connections taken from a main to the risers are illustrated in Fig. 2, and the horizontal pipe is always at least one size larger than the riser, and should have a considerable fall from the foot of the latter to the main, and this fall is usually given by cutting a crooked thread on the end of the pipe which is screwed into the bottom of the riser.

A 45 degree elbow is sometimes used where the branch is taken off the main and such a fitting has a slight advantage over one of 90 degrees, as is shown.

With the branches falling back to the steam main, and the latter falling away from the boiler, it will be seen that the return main will receive all of the condensation resulting from the emission of heat in the building, and

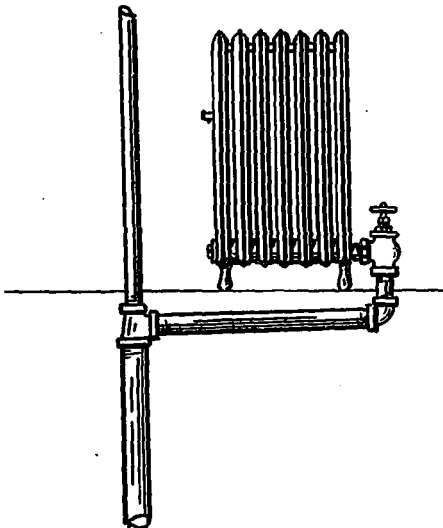


Fig. 3—SHOWING THE MANNER IN WHICH CONNECTIONS TO A RADIATOR SHOULD BE MADE, THE CONNECTION BEING PLACED ON THE SIDE OPPOSITE THE RISER.

that the flow of such condensation will be assisted in so far as the main is concerned, by the flow of steam in the same direction, and will be retarded in the branches by the flow of steam in the opposite direction, but the in-

crease in the size of the branch compensates for the latter unfavorable condition.

Another feature about a heating system, particularly one in which steam is the agency, which requires attention, is that provision must be made for the expansion of all portions of the plant, and this is especially true with regard to the main and the risers.

A reference to Fig. 2 will show that the lateral movement of the steam main will be permitted without damage to the piping steam, because of the ease with which the branches will "swing" on the elbows, and for that reason the branches, particularly at points far removed from the boiler, should never be made short, or in any way rigid.

Special provision for expansion should also be made in the case of risers, and it will be noted that the branches are taken off the latter at the upper floor in a manner differing from that in use at the ground floor, but in no case is it desirable that these branch connections should be short.

The connections for the radiators at the ground floor are merely taken out of the side of the tee and run direct to the radiator, because owing to the short distance between such connections and the foot of the riser, practically no expansion takes place.

As they rise to each successive floor, however, the aggregate expansion becomes greater, so that ample pro-

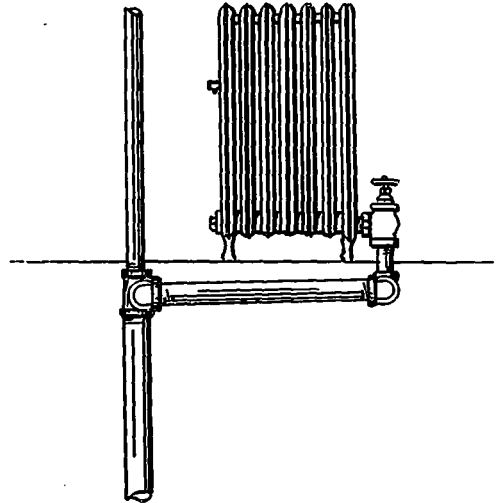


Fig. 4—IT WILL BE NOTICED THAT, REGARDLESS OF THE NUMBER OF FITTINGS ON THE BRANCH, THE CONNECTION IS MADE AS INDICATED IN FIG. 3.

vision must be made for it, otherwise broken connections or radiators lifted off the floor will result.

The illustration shows how such provision may be made, and it is merely by turning the face of the tee in a direction at right angles with the location of the radiator, and then using a short nipple and elbow turned toward the radiator, with two more elbows and a nipple under the valve, such an arrangement will provide a sufficient number of fittings on which the upward movement of the pipe may be compensated for.

In this way too, a considerable fall may be given the branches at each floor, and, as will be obvious, when the risers are of great length, as for example six stories or more, full advantage should be taken of the opportunity to give "fall" to these branches, because the movement upward of the main would be considerable at such heights.

(Concluded on page 76.)

PROSPECTIVE CONSTRUCTION

The following information is obtained from our correspondents, from architects, and from local papers. These items appear in our daily advance reports and are herein compiled for the use of subscribers to the monthly issue of CONSTRUCTION. Should any of our readers desire this information oftener than once a month, upon receipt of request, we will be pleased to submit prices for its daily service.

Mills and Factories

Belleville, Ont.—H. Corby, M. P., and Fred R. Tingham, of Belleville, Ont., are considering the advisability of erecting a cement works to cost \$7,000,000 at this place.

Brampton, Ont.—A by-law will be submitted to the ratepayers of Brampton, Ont., in the near future to authorize the exemption from taxes and other inducements to the Crossin Planks Co., of Toronto, which proposes establishing a plant here. The council of this town are actively interesting itself in the passage of this by-law, and there is no doubt it will pass.

Brockville, Ont.—The factory of the Brockville Hat Works will be enlarged by a two story addition, 40 x 70 ft., to cost not less than \$40,000.

Caledonia, Ont.—Coppley, Noyes & Randall, clothing manufacturers, head office, Hamilton, intend enlarging their factory at Caledonia, Ont. Plans are being prepared, and it is expected that the improvement will be made this spring.

Port Colborne, Ont.—It is not quite certain whether the Mackay Flour Mill Co. will rebuild their mills recently destroyed by fire in Kenora, or erect them at Port Colborne. D. C. Cameron, the President, will hold a meeting of the Directors shortly, when the matter will likely be definitely settled.

Clinton, Ont.—The Doherty Organ Co., of Clinton, which has been granted a Dominion charter, proposes to form itself into a joint stock company, increasing its capital for the purpose of enlarging its present plant. The company owns a loan the town granted some time ago, but a proposition will be voted on in March by the ratepayers covering the settlement of same by the town taking some of the company's stock.

Cobalt, Ont.—The Directors of the Nipissing Mine in Cobalt, with head offices in Toronto, have decided to spend \$75,000 in the erection of a concentrator mill for the reduction of the mine's ore.

Guelph, Ont.—Finlay Marshall, of this place, at the next session of the Legislature will seek permission to build an abattoir in this city. The company which Mr. Marshall represents will spend in the neighborhood of \$50,000 in the erection of the proposed plant if they secure the necessary power. Ald. Booth, of the city council, has been active in furthering this scheme.

Guelph, Ont.—A. Sherman Simpson, Chairman of the Railway and Manufacturers' Committee of the city of Guelph, is considering an offer from Mr. S. J. Taylor, who proposes erecting a linseed oil mill here providing Council will grant him certain concessions.

Goderich, Ont.—George Habel, of this city, has been awarded the contract for the concrete work in connection with the proposed additions to the Doty Engine Works, at this place. The main building will be 150 ft. long and 40 ft. wide. Powerhouse 60 x 40 ft. D. McLaren, also of Goderich, has been awarded the contract for the carpentry and woodwork. The Doty Co. are erecting the steel work.

Hastings, Ont.—W. Bird & Sons, manufacturers of Paroid Roofing, are considering the establishment of a Canadian factory at this place for the purpose of supplying the Dominion trade.

Lakelse, B. C.—The material taken from the ruins of the Dickson Co. woollen mill recently destroyed by fire at this place will be used for the purpose of erecting a lumber mill for J. Moore & Son.

Kempville, Ont.—The Kempville Milling Co., this place, proposes erecting a mill for the manufacture of flour providing the council will grant them certain exemptions.

Hampton, Ont.—The Canadian Writings Co., Limited, of Hamilton, Ont., has just been incorporated for manufacturing duplicating writing presses. The capital is \$30,000, and it is expected this company will shortly commence the erection of a factory. The company is composed of Jos. Kneeshaw, Ambrose P. Vanleet, George Wenig, John P. Hennessy and Fred. W. Gates, all of this city.

Kingsville, Ont.—The tobacco factory of George Jasperson, Kingsville, Ont., was recently burned to the ground, entailing a heavy loss, partly covered by insurance.

Niagara Falls, Ont.—Architect Crompton, of this city, has prepared plans for an enameling plant to be erected for the Sanitary Can Co. It will be 80 ft. long and 32 ft. wide and 22 ft. high, built of solid brick and stone. W. S. Honan, of this place, who has the contract for the erection of the whole plant, will construct the building.

Paris, Ont.—Messrs. Stringer & Smith, of Woodstock, have made an offer to the council of Paris, Ont., that if the city will remodel the market building, they would locate here and use the remodelled structure for the purpose of manufacturing pipe organs and pianos. The council have decided to accept their proposition.

Pictou, Ont.—The St. Lawrence Dairy Producers Co., of Morrisburg, Ont., is considering the establishment of a whey butter factory in Pictou, Ont., to cost \$15,000.

Stratford, Ont.—The Shuddy Cloth Mill, owned by Benjamin Leckie, of this place, was recently damaged by fire to the extent of \$2,000, covered by insurance.

Tweed, Ont.—Daniel Smith, President, and C. A. McPherson, Secretary-Treasurer, of the Ontario Powder Co., Kingston, Ont., state that the powder plant which was recently destroyed at Tweed will be rebuilt at once.

Montreal, P. Q.—The fur factory of C. Bessette, corner Notre Dame St. and Dollard Lane, was recently damaged by fire, causing a loss of about \$30,000, covered by insurance.

Granby, P. Q.—S. H. C. Miner, formerly President of the Consolidated Rubber Co., has finally decided that he will erect a large mill for the manufacture of rubber goods, particularly rubber shoes and boots. Mr. Miner, whose present address is Granby, P. Q., states that he will commence building operations about May 1st next. His Montreal office is in the Canada Life building.

Mason, P. Q.—The Senechal shoe factory here was recently destroyed by fire, entailing a loss of at least \$40,000. Insurance, \$16,000. It has not yet been ascertained as to whether the firm will rebuild.

Perrault, P. Q.—The nitro-glycerine mills of the Standard Explosives, Limited, of Montreal, situated at Ile Perrault, P. Q., were utterly destroyed in a recent explosion. The company will rebuild at once.

Quebec, P. Q.—The Vincent Cahillard, Montreal, President of the Trust & Loan Co. of Canada, and the Brier-Perecek Locomotive Co. of London, Eng., together with Colonel Hyde, also of Montreal, have formed a company which proposes erecting a large locomotive works at or near Lachine, P. Q., involving an investment of at least \$1,000,000. It is altogether possible that erection will begin early in spring.

Quebec, P. Q.—The Canadian Pacific Railway Co., Montreal, propose erecting stock yards and buildings to cost between \$1,500,000 and \$2,000,000 on Frontenac St. Buildings are to be completed by July 1st next. J. S. Paynter, Montreal, is the architect.

Three Rivers, P. Q.—The National Tool and Axe Works factory, operated by T. C. Hawthorne, at Three Rivers, P. Q., was recently destroyed by fire, entailing a loss of \$5,000, covered by insurance.

New Westminster, B. C.—D. C. Patterson, manager of the Vulcan Iron Works, has asked the council of New Westminster for a site on which to erect an addition to the boiler works.

Milltown, N. B.—The grist mill at Milltown, N. B., owned by McAllister Bros., of St. Stephen, N. B., was recently burned to the ground, entailing a heavy loss, covered by insurance. It is understood that the plant will be rebuilt.

Dalhousie, N. B.—The Dalhousie Lumber Co., of Dalhousie, N. B., H. A. and A. H. Hilliard, local managers, intend rebuilding the plant which was destroyed by fire recently. The new mill will be 125 x 75 ft., and will cost, together with machinery to be installed, about \$140,000.

Moncton, N. B.—Rhodes, Curry & Co., of Amherst, N. S., are considering the erection of a steel plant at this place for the manufacture of railway supplies.

Kamloops, B. C.—The Thompson Valley Canning Co., of Kamloops, B. C., composed of Frank Rushton, A. E. McLaughlin, Dr. M. S. Wade, C. H. Strutt and W. T. Shavin, with a capital of \$15,000, propose erecting a cannery at this place.

Vancouver, B. C.—The Barber Mattress Co., of this city, proposes erecting an addition to its factory to cost \$4,000. This work will be commenced in the near future.

Regina, Sask.—A. T. Hunter, President of the Regina Flour Mill Co., states the company will in a short time rebuild the mill which was recently destroyed by fire.

Melfort, Sask.—J. A. McDonald, of Melfort, Sask., has been awarded the contract for a large machine shop to be erected at this place for S. J. Greenwood.

Lanigan, Sask.—W. J. Robinson, formerly of Winnipeg, is in Lanigan, Sask., where he proposes erecting a large sash and door factory early this spring.

Winnipeg, Man.—Architects Northwood & Nutter, Winnipeg, Man., have completed the plans for the proposed plant to be erected in St. Boniface for the Manitoba Linseed Oil Mills Co., of Winnipeg, at a cost of \$75,000. It is understood tenders for this work will soon be called.

Winnipeg, Man.—Mr. MacLachlan, General Manager of the American Bank Note Co., is at present in Winnipeg for the purpose of selecting a site on which this company will erect a large printing and lithographing plant.

Medicine Hat, Alta.—The brick plant of the Canada Brick Co., Medicine Hat, Alta., was recently destroyed by fire, entailing a loss of \$7,000, partly insured. It will be rebuilt.

Gas Plants, Elevators and Warehouses

Toronto, Ont.—A storage warehouse at 90-92 Shaftesbury Ave., owned by Mr. Nicholas Garland, Toronto, was recently damaged by fire, entailing a loss of \$2,500, covered by insurance.

Bridgeburg, Ont.—H. G. Anderson & Co., of Buffalo, N. Y., have purchased the Baxter elevator at this place. This firm intends remodeling and altering the interior and putting in concrete foundations and also platform scales for weighing team loads.

Brockville, Ont.—The Economical Gas Appliances Construction Co., of Montreal, P. Q., Toronto, have been awarded the contract for the installation of a set of four prairie boxes for the gas works here, at a contract price of \$9,520.

Deseronto, Ont.—The council of the town of Deseronto, Ont., have decided to secure plans, specifications, prices and general data regarding a 100 h.p. producer gas plant and gas engine which they propose installing at the waterworks for operating the pumping plant.

London, Ont.—Architect Wm. G. Murray, London, Ont., has prepared plans for the proposed warehouse to be built by McLachlan & Granger, of this city, on York St. opposite the Grand Trunk station. It will be 50 ft. x 100 ft., four stories in height. Architect's address is Masonic Temple, London, Ont.

Port Rowan, Ont.—Mr. Rumball, ex-mayor of the city of London, Ont., states that he is forming a company for the purpose of laying and operating a pipeline from Port Rowan to London for the supplying of that city with natural gas.

Toronto, Ont.—Fire did \$10,000 damage to the warehouse at 121 Bay St. recently, occupied by several firms, and owned by Mrs. Roof, in care of the Toronto Trusts Corporation.

London, Ont.—Architect W. Fletcher Shepley, London, Ont., has prepared plans for a store and warehouse to be erected for Miss Jeffrey, London. It will have stone foundation, brick and stone superstructure, composition roof, Georgia pine interior finish, three floors and basement. Specifications include: Hot water heating, electric lighting, modern plumbing (three closets and lavatories), metallic lath, structural iron, freight elevator, sheet metal work, metal roofing, plate glass, sashmatic glass.

Quebec, P. Q.—The warehouse of J. A. Gagnon & Frere, Quebec, P. Q., was recently destroyed by fire, entailing a loss of about \$7,000. It will likely be rebuilt.

Winnipeg, Man.—S. B. Cunningham, of the Hamilton Brewing Association, Hamilton, Ont., states that early this summer a committee in Winnipeg on which this Association proposes erecting a warehouse for the storage of their products. W. T. Marter, of Winnipeg, Man., has been appointed local agent for the Association.

Winnipeg, Man.—Architect Victor M. Horwood, Winnipeg, has completed plans and specifications for a two-story warehouse, 120 x 60 ft., and a factory, 35 x 62 ft., to be erected for the Merrick, Anderson Co. of this place. Fireproof construction will be used. A large tank, capacity 500 barrels, will be placed in the floor of the warehouse for the storage of tar. This firm manufactures tar paper goods.

Winnipeg, Man.—Merrick Anderson, of Elmwood, a suburb of Winnipeg, Man., is having plans prepared for the erection of a two-story warehouse, 120 x 60 feet, at the corner of Renton and Lewis Streets.

Winkler, Man.—The elevator at Winkler, Man., owned by the Olivier Milling Co. of Toronto, was recently destroyed by fire, causing a loss of \$15,000, fully covered by insurance.

Vancouver, B. C.—W. A. Clark & Co., real estate dealers, of this city, state that they have sold a piece of property on Water Street to E. Horsley of Spokane, Wash., who intends erecting a five story brick and stone warehouse thereon.

Vancouver, B. C.—James Stark & Son, of this city, have purchased through Mr. Clark, real estate agent, Vancouver, a site on the N. E. corner of Abbott and Hastings St., on which they propose erecting a six-story warehouse 120 x 60 feet, for their use. The lease of the present tenants does not expire until March 1st, 1906, but it is expected this difficulty will be overcome and building commenced in spring.

Vancouver, B. C.—Mr. Akroyd, of the firm of Richards & Akroyd, Vancouver, states that it is his intention to erect a six-story warehouse and office building on the S. E. corner of Seymour and Hastings St. early this spring.

Vancouver, B. C.—The Brackman-Ker Milling Co. of this city, secured permission to erect a large warehouse on the inlet water front here in North Vancouver.

Regina, Sask.—The George M. Hendry Co., of Toronto, manufacturers and dealers in school furniture and supplies, propose purchasing a site and erecting thereon a branch warehouse in Regina, Sask. Mr. Rhodes, of this company, will be the local manager.

Electrical Construction

Guelph, Ont.—Stevenson & Malcolm, of this city, have been awarded the contract for the lighting and wiring of the city hall. H. O'Connor, of this city, has been awarded the contract for the metallic ceilings.

Galt, Ont.—The council of the town of Galt have passed a by-law authorizing the expenditure of \$66,000 for the installation of a distributing plant for hydro-electric power. Construction on this work will be begun very shortly.

Oshawa, Ont.—Alexander & Miller, of Peterboro, have secured the contract for the wiring of the city hall at Oshawa.

Beausville, Ont.—The Dunville, Wellandport & Beausville Railway Co., composed of the following directors: Jas. A. Ross, Wellandport; F. R. Lator, M.P., W. J. Aikens, Mayor Smith, P. J. Ramsay, Thomas Marshall, H. L. Parry, E. J. Edgewood, and E. E. Anderson, of Dunville, Ont., propose erecting an electric railway between these points to cost \$250,000.

Bridges, Wharves and Subways

London, Ont.—The London township council, with offices in London, Ont., and the Middlesex county council, in the expenditure of \$15,000 to repair the Guest bridge on the fifth concession of London township. This bridge will be practically rebuilt, and tenders will soon be called for the work.

St. Thomas, Ont.—At the last meeting of the Elgin county council at St. Thomas, Ont., it was decided to replace all the wooden bridges in the county by iron, steel and reinforced concrete structures. Tenders for these bridges will be called as soon as plans and specifications are completed.

Chute a Blondeau, Ont.—Fred. Getman, Sec. Dept. of Highways, Ottawa, Ont., will receive tenders until March 18th for the construction of a landing pier at Chute a Blondeau, Prescott county, Ont., according to plans, specifications and forms of tender with the above department, with J. L. Michaud, Merchants Bank Bldg., Montreal, and the Post Master at Chute a Blondeau, Ont.

Middlesex County, Ont.—Mr. Talbot, engineer of the Middlesex county, at Alvington, Ont., will receive tenders until March 27th for the erection of a reinforced concrete bridge 60 ft. in length on the town line between Mesa and Brooke, and two steel bridges in the north part of Nissouri township each 55 ft. in length.

Wingham, Ont.—D. Wetherspoon, of Ailsa Craig, has been awarded the contract for the concrete work on Warren's bridge, south of Halls' Hall, a structure north of Aylesfield which will be a cement arch bridge, and Wingham bridge, at a price of \$5,000 for the three bridges.

Wingham, Ont.—A. Hill & Co., Mitchell, Ont., were awarded the contract for the erection of the suspension bridge over the Redwood bridge at Wingham at a contract price of \$6,585.

Hawkesbury, Ont.—Mr. Lapointe, Warden, and Mr. Berthiaume, Reeve, are heading a deputation to attempt to have the Dominion Government erect a bridge over the Ottawa River at this point.

Quebec, P. Q.—The management of the Quebec Railway, Light, Heat & Power Co. of this city, has decided to have constructed early this spring a steel suspension bridge over the Montmorency River for the use of their employees.

White Point, N. S.—Reid & Archibald, of Halifax, N. S., have been awarded the contract for the White Point wharf extension, White Point, Victoria county, N. S., at a price of \$28,936.

Winnipeg, Man.—On motion of Alderman Midwinter and Jos. A. Potter, of Elmwood, a suburb of Winnipeg, Col. H. N. Rutlan, city engineer of Winnipeg, Man., has been instructed by the council to prepare plans and estimates for a bridge to cross the river at that place to accommodate pedestrian, vehicular and street car traffic.

Winnipeg, Man.—The Dominion Bridge Co., of Montreal, have been awarded the contract for the erection of the steel superstructure of the Redwood Street bridge here. Work to be commenced by next fall.

Winnipeg, Man.—Col. H. N. Rutlan, city engineer of Winnipeg, Man., is preparing plans for the enlargement of the Main Street bridge over the Assiniboine River here. This work will be undertaken this summer.

Brandon, Man.—The city council of Brandon has decided to extend the time for receiving tenders for the new bridge over the Assiniboine River here until March 14th, 1908. The new structure will cost \$60,000.

St. Boniface, Man.—The plans of the bridge which the city of St. Boniface (near Winnipeg) propose erecting over the Seine River have been approved, and construction work will shortly begin. The structure will be built of masonry and reinforced concrete at a cost of \$40,000.

Regina, Sask.—The Canadian Pacific Ry. Co. proposes erecting a bridge over the Winnipeg River here early this spring.

Strathcona, Alta.—The ratepayers of this place have passed a by-law authorizing the expenditure of \$17,500 for the construction of a traffic section to the railway bridge which the C. N. R. propose erecting here over the Saskatchewan River.

Calgary, Alta.—The Canadian Pacific Ry. Co. propose erecting two subways under its tracks at this place. Construction work on the First Street subway will commence early in May.

Vancouver, B. C.—J. A. L. Waddell, Vancouver, B. C., has been instructed by the special bridge committee of the council of this city to advertise for tenders for the proposed bridges over False Creek and Westminster Avenue as soon as the plans are approved by the Dominion Government.

Waterworks, Sewers and Canals

Brockville, Ont.—The city engineer of Brockville, Ont., has been instructed by the council to secure specifications and estimates for a pumping outfit with a capacity of 6,000,000 gallons.

Chaudiere, Ont.—J. B. McRae, C. E., and William Kennedy, C. E., have been appointed to represent the Chaudiere Power Co. and the Ottawa Power Co., who propose building a dam at Chaudiere over the Ottawa River this summer at a cost of \$150,000. These gentlemen, it is understood, have offices in Ottawa.

Guelph, Ont.—W. M. Davis, Civil Engineer, of Berlin, Ont., has been engaged by the city council of Guelph to take charge of the work regarding improvements to the waterworks system here. Mr. Davis will at once prepare plans and estimates, and as soon as they are approved tenders will be invited. The improvements will cost in the neighborhood \$125,000.

Hamilton, Ont.—Mr. Barrow, city engineer of Hamilton, will recommend to the council that the sum of \$600 be expended in building a suitable structure and installing a pumping system propelled by gas engines using natural gas to supply the residents of the mountain top.

Leamington, Ont.—J. R. Gordon, electrical engineer of Sudbury, Ont., is preparing plans for the enlargement and improvement of the present electric light plant in Leamington, Ont., which he proposes taking over from the present company. Mr. Gordon proposes supplying power as well as light, both to be generated by gas engines.

Ottawa, Ont.—Mr. Barrow, city engineer of Ottawa, Ont., has completed plans of a system of drainage for the village of Hintonburg, recently annexed to that city. The cost of the work is estimated at \$70,000.

Peterboro, Ont.—The by-law to raise by debentures the sum of \$10,000 for the purpose of improving and extending the waterworks system of Peterboro has been approved by the Board of Railway Commissioners, and it is expected this work will be undertaken in a very short time.

Ottawa, Ont.—K. Jones, Secretary Dept. Railways and Canals, Ottawa, will receive tenders until March 24th for the supplying and delivering of British Columbia and Douce Lake fir timber required for work on the Rideau canal. Specifications and bills of timber can be obtained from the Superintending Engineer, Rideau Canal, Canadian Railway, Slater St., Ottawa. A cheque for \$100 must accompany tenders.

Perth, Ont.—The council of Perth, Ont., proposes spending about \$8,500 in drainage and sewage works in the near future.

Stratford, Ont.—The water commissioners of the city of Stratford have finally decided to issue debentures to the extent of \$15,000 to cover the cost of the installation of a mechanical water filter for the city's water supply, having a capacity of 1,500,000 gallons daily.

Montreal, P. Q.—George Janin, superintendent of the waterworks department, Montreal, will receive tenders until March 24th for the construction and delivery of one twelve million gallon steam pump for the low level pumping station in Montreal. Specifications and information may be obtained at the above office. Each tender must be accompanied by an accepted cheque for \$6,000.

Winnipeg, Man.—The city council of Winnipeg have decided to call for tenders for the installation of a 2,500,000 gallon pump at well No. 5 at a cost of about \$12,000.

Winnipeg, Man.—City Engineer Shillinglaw, of Winnipeg, Man., has been instructed by the council to lay a pipe line across the bed of the Red River between Winnipeg and Elmwood for the purpose of conveying the surplus water from the well at Elmwood to the mains of Winnipeg.

Calgary, Alta.—Mr. Hill, acting city engineer of Calgary, Alta., has completed estimates for the supplying of two pumps with a capacity of 45 gallons per minute, and the installation of two tanks to contain 1,000 gallons, for the purpose of draining two subways under the railway tracks here. Cost of improvements about \$25,000.

Indian Head, Sask.—The Council of Indian Head, Sask., have decided to issue debentures to the extent of \$10,000 for the purpose of extending the waterworks system here. Work will be begun in the near future.

Victoria, B.C.—Alderman Fullerton, chairman of the fire warden of Victoria, B.C., will recommend to the Council the installation of two electrically driven pumps of 400,000 gallons capacity and the laying of suitable mains ranging from eight to fourteen inches in diameter through the business district of the city.

Victoria, B.C.—Wm. W. Northcott, purchasing agent for the City of Victoria, B.C., will receive tenders until March 16th for the supplying of the following cast iron pipe: 33' of 24-inch pipe, 18,000 feet 8-inch, 36,500 feet 6-inch, 10,000 feet 4-inch as per specification with the above, delivered by September 1, 1908.

Railway Construction

Toronto, Ont.—City Controller J. J. Ward and Vice-President Fitzhugh, of the G. T. R., are considering the removal of the present Parkdale Station and the erection of a new station at the Junction of Queen and King Sts. in Toronto.

Toronto, Ont.—The Grand Trunk Railway System proposes converting its station at the foot of Yonge St. into a fruit market. Improvements amounting to \$1,000 will be made.

Brockville, Ont.—The G.T.R. engineers have surveyed the site at this place on which the proposed thirty-eight stall roundhouse will be erected early this coming spring.

St. Thomas, Ont.—The Pere Marquette Railway Co., propose abandoning their present station at the corner of Kains and Station Street and erecting a much larger structure at the corner of Wellington and Station Streets this spring.

Montreal, P. Q.—The management of the Montreal Light, Heat and Power Co., propose making several large extensions to its present street railway system in Montreal, involving the expenditure of about \$75,000.

St. Anne de Beaupre, Tadoussac.—Mr. Rodolphe Forget, M.P., a member of the company of English capitalists who propose Montreal stock exchange, has organized a railroad from St. Anne de Beaupre, Tadoussac, N.B., 120 miles, at a cost of \$5,000,000.

Gaspe, P. Q.—J. K. Lavier, of Gaspe, P. Q. in company with Lord Ranfurley, of London, Eng., vice-presidents of the Atlantic, Quebec and Western Railway Co., propose erecting a railway through the Gaspe Peninsula, to cost in the neighborhood of \$6,000,000, and to be completed in about two years time. There will be twenty-six concrete bridge

constructed on the line of the railway, to cost about \$1,000,000, and also a tunnel through Lake Opey, 800 feet long.

Winnipeg, Man.—Hugh D. Lumsden, chief engineer of the Transcontinental Railway, with head offices in Montreal, states that the railway will erect a roundhouse at St. Boniface and that such a one has been completed. The work of construction on the shops will be commenced in the very near future.

New Westminster, B.C.—Mr. Keary, Mayor of New Westminster, B.C., has received a communication from the Great Northern Railway, to the effect that the company has had plans prepared and will shortly commence the erection of the proposed new station here.

Estevan, Sask.—The Canadian Pacific Railway Company proposes erecting a depot here to cost \$20,000 early this summer. The company also intends enlarging the present roundhouse and erecting a machine shop at this place.

Civic Improvements

Outremont, P.Q.—The Council of Outremont, P.Q., will draft a by-law authorizing the town to borrow \$150,000, for the construction of drains, sidewalks and roadways, and will submit same to the voters early in June. Mr. Beaubien is chairman of the Roads Committee.

Verdun, P.Q.—The Council of this place propose expending the sum of \$205,000, for the following improvements: Macadamizing of streets, \$50,000; waterworks and filtering plant and water mains, \$75,000; erecting town hall, police and fire station, \$40,000; sewers, \$20,000; concrete sidewalks, \$15,000; extensions to electric light system, \$5,000.

Edmonton, Alta.—The Commissioners of the city of Edmonton, Alta., propose expending the following amount at once: Concrete sidewalks, \$18,155; sewer construction in various portions of the city, \$92,092; water mains construction in various portions of the city, \$18,615; water and sewer service connections, \$45,765.

Public Buildings

Toronto, Ont.—The Board of Control of Toronto are considering the advisability of erecting a branch library building on Gerrard Street east of Parliament Street. Alderman Thomas Foster is promoting the project.

Kingston, Ont.—Michael Sullivan, Kingston Ont., has been awarded the contract for all work except heating on the proposed sergeants' quarters building in connection with the Royal Hotel, Kingston, Ont., at a price of \$80,000. H. P. Smith, supervising architect, Kingston, Ont. Specifications include stone foundation, stone and brick superstructure, sixteen baths, closets, sinks, etc., and gravel roof, wood interior finish, cement work, cut stone, mantels, reinforced concrete, metallic lath, sheet metal work.

Guelph, Ont.—The Council of Guelph, Ont., through Mayor Newstead, are endeavoring to buy from the Dominion Government a piece of land and 150 x 120 feet, which the city proposes erecting an annex to the Winter Fair Building.

Port Arthur, Ont.—Mr. Sherwood, of this city has been awarded the contract for certain additions to the Post office here. Work on the improvements will commence as soon as the weather permits.

Dundas, Ont.—At a meeting of the Council of Dundas, Ont., on motion of Mayor Moss and J. P. Spittal, of the Council, it was decided to ask Andrew Carnegie for a grant of \$10,000 for the purpose of erecting a library.

Simcoe, Ont.—Schultz Bros., of Brantford, Ont., have been awarded the contract for the erection of a public building at Simcoe, Ont., for the Dominion Government at a contract price of \$23,400. Work to be completed in twenty months.

Renfrew, Ont.—The Town Clerk of Renfrew, Ont., has been instructed to gather information with reference to the question of securing a donation from Andrew Carnegie.

Alliston, Ont.—The Council of Alliston, Ont., propose asking Andrew Carnegie for a grant of \$12,500 towards the erection of a library at this place.

Durham, Ont.—The Council of the Town of Durham, Ont., are considering the advisability of erecting a new town hall and market place. They have secured options on several sites and it is expected definite action will be taken in the near future.

Guelph, Ont.—The Provincial architect, Parliament Buildings, Toronto, is preparing the plans for the proposed Winter Fair buildings to be erected here at a cost of \$35,000. The city of Guelph will donate \$25,000 towards the structure and the Government will spend \$25,000. The Public Works Department of the Province of Ontario will call for tenders as soon as these plans are completed.

St. Roch, P.Q.—Hon. Rodolphe Lemieux, postmaster general, has visited this place and states that the Department of Public Works will shortly proceed to erect a post office here at the corner of Dorchester and St. Joseph streets.

Magog, P.Q.—The Council of Magog, P.Q., propose calling for tenders for the erection of a new building here. Plans are being prepared and tenders will be called for shortly.

Winnipeg, Man.—Fred. Gellinas, Sec.-Treas. Public Works Department, Ottawa, will receive tenders until March 20th for the erection of an examination house at Winnipeg, Man., according to plans and specifications and forms of tender to be obtained from the Department, Ottawa, Ont., and from Jos. Greenfold, Supt. of Public Buildings, Winnipeg, Man. All tenders to be accompanied by an accepted cheque for 10 per cent. of the amount of tender.

Winnipeg, Man.—The Public Parks Board of Winnipeg, are inviting plans for a pavilion and shelter to be erected in Assiniboine Park, and as soon as plans are chosen tenders will be called for the work. J. H. Blackwood is Secretary.

Saskatoon, Sask.—Excavation has been commenced on the site of the proposed Post Office and Dominion Government buildings. Government at a cost of \$100,000. Work as spring opens up work on the structure will be rushed ahead.

Business Buildings

St. Thomas, Ont.—Architect Neil R. Darach, St. Thomas, Ont. is preparing plans for a store building for Messrs. Ingram & Daver, hardware dealers, of this place.

Teeswater, Ont.—M. Doest, of Teeswater, is in the market for the materials required for a brick business block which he proposes erecting next summer in Teeswater.

Kenilworth, Ont.—Architect Geo. Gray, Hamilton, Ont., is preparing plans for several business buildings and residences to be erected in Kenilworth. Work on the structure will, in all probability begin early this spring.

Niagara Falls, Ont.—Cheley & Wilcox, of this city have the contract for remodeling of the old Niagara House into a modern store building. Mrs. C. Dett, of this city, is the owner.

Goro Bay, Ont.—The Gamey Block here, was recently damaged by fire to the extent of \$10,000 to the building, partly covered by insurance. This building is owned by Mr. Gamey, harness dealer.

Latchford, Ont.—The Alexandra Hotel, The King Edward Hotel, the Empire Lumber Co.'s store in Latchford, Ont., in the Post Office, was recently destroyed by fire, entailing a loss of about \$70,000.

Mitchell, Ont.—The T. S. Ford Co., Ltd., Mitchell, propose building a 40 foot extension at the rear of their present store early this spring. The addition will be two storeys high.

Wallacuburg, Ont.—The business block owned by S. Collinge, of this place was recently destroyed by fire. The loss is covered by insurance.

Athers, Ont.—A brick business block owned by Wm. Parish, at Athens, Ont., was recently burned to the ground, entailing a loss of about \$12,000, partly covered by insurance.

Montreal, P.Q.—Arthur St. Louis, Architect, 80 St. Gabriel St., Montreal, has prepared plans and awarded contracts for the mason, stone, and general contracting to A. St. Denis, Piere, contractor and Wellington, Ont., Montreal, and the contract for the steel and iron work to the Phoenix Bridge Co., of Montreal, P.Q., and Phoenixville, Pa., for the construction of a store building to cost \$10,000, to be erected at the corner of St. Denis and DuRoi Sts., Montreal, for Arsene Lamy, 779 St. Hubert St. The building which is to be of stone and buff brick construction, three storeys high, 75 x 100 ft., is to be completed by May 1st.

St. John, N.B.—Architect F. Neil Brodie, 42 Princess St., St. John, N.B., has prepared plans for the remodeling the store premises of Henderson & Hunt, St. John, N.B. Specifications include hot water heating, electric lighting, open plumbing, pitch and gravel roof.

Wawanawa, Man.—The business block owned by Mr. Main of this place was destroyed by fire, causing a loss of \$8,000, partly covered by insurance.

Brandon, Man.—H. C. & Co., dry-goods merchants of this city, have purchased the Syndicate Block which they propose enlarging and remodeling into a store, at a cost of \$15,000. Mr. A. D. Rankin is the owner.

Minitonas, Man.—At a fire which occurred recently at Minitonas, Man., the following losses were sustained:—E. Widmeyer, Minitonas Hotel, loss \$10,000, insurance \$3,000; J. H. C. Hunt, general store, loss \$8,000, insurance, \$7,000.

Carberry, Man.—The Bazaar Building, owned by Thos. White, of this place, was recently destroyed by fire, entailing a loss of \$10,000 to the building, covered by insurance.

Salmon Arm, B.C.—S. M. McGuire and B. V. Leonard, of this place, propose erecting a two-story brick building of 35 feet frontage and 40 feet depth. It will contain two stores on the ground floor, the upper story to be used as an assembly hall and lodge rooms for the Masonic Order to be formed here in the near future. Building operations, it is understood, will commence in the spring.

North Vancouver, B.C.—Messrs. J. A. McMillan and P. Larson, of North Vancouver, B.C., propose erecting a two storey, 27 x 60 ft. brick building on the Esplanade. The ground floor will be fitted as a store, the upper floor to be used as a public hall.

Vancouver, B.C.—Alderman Walter Heppner has been awarded the contract for the erection of a six storey office building on Pender St. for Martin & Robertson of this place. Architects Parr & Fee, Vancouver, prepared the plans.

Vancouver, B.C.—Mr. Elwood, of New Westminster, B.C., has instructed Architect W. Nicholas Lalley to prepare plans for a two storey business block to be erected on the Esplanade here. The ground floor to be fitted up as a restaurant, the upper floors to consist of living rooms.

Vancouver, B.C.—The national Finance Co., Ltd., 412 Hastings Street, Vancouver, B.C., propose erecting a three-story store, office and apartment building on the corner of Hester and Pender Sts., Vancouver, B.C.

Vancouver, B.C.—Architects Darling & Pearson, Imperial Bank Chambers, Toronto, are preparing plans for a six storey stone and steel office building for the Canada Life Insurance Co., Head Office, Toronto. The structure will cost \$300,000.

Books

Toronto, Ont.—The Thornton-Smith Co., 11 West King St., have been awarded the contract for the interior painting, decorations and glazing of the Royal Bank Building on King St.

Toronto, Ont.—W. J. Hynes, 16 Gould St., Toronto, was awarded the contract for the plaster and ornamental plastering and carved stone cement work in the new Bank of Commerce Building now under construction in Montreal. Darling & Pearson, Imperial Bank Chambers, Toronto, are the architects.

Brantford, Ont.—Architect Chas. Mills, Bank of Hamilton Chambers, Hamilton, Ont., has prepared plans for alterations in the branch bank, the Bank of Hamilton at Brantford. The work consists of stone foundation, brick and stone front and superstructure, felt and gravel roof, oak interior finish, steam heating, electric lighting three storeys high. Specifications include Marble, tile, structural iron, vaults, electrical work, plastic relief work, plate glass.

Welland, Ont.—The Royal Bank, with head offices in Toronto, have rented the McMurray Block here and will remodel same for the purposes of a bank office. Percy S. Peacock, of this city, has the contract for this work.

Hamilton, Ont.—John E. Riddel, of this city, has been awarded the contract for the roofing, copper work, metal frames and sash for the Landed Banking & Loan Co.'s building here.

Vancouver, B.C.—Architect C. O. Wickenden, Vancouver, B.C., has prepared plans for extensions to the premises of the Bank of British North America, with Head Office for Canada in Toronto, Ont. The improvements include an addition to the ground floor, and a high basement with entrance on Richards St. to be faced with granite and sandstone.

Victoria, B.C.—The Royal Bank of Canada, with Head Office in Toronto, Ont., have purchased a site on Government Street, Victoria, for the purpose of erecting a branch bank building. It is understood the lease on this property does not expire for eighteen months.

Prince Albert, Sask.—The Imperial Bank of Canada, with Head Offices in Toronto, Ont., propose erecting a branch bank in this place. Work on the structure will commence this spring.

Clubs and Societies

Palmerston, Ont.—J. Poole, in charge of the local branch of Salvation Army here, states that it is the intention of this organization to erect new barracks here in the spring.

London, Ont.—Architect Wm. G. Murray, London, Ont., has prepared plans for a club house, to cost \$2,000, for the St. John's Athletic Club, London. It will be of frame construction, enclosing a high 40 feet, having hot air heating, electric lighting, modern plumbing, and will contain gymnasium, stage, baths, lavatory and committee rooms.

Ottawa, Ont.—Architects Darling & Pearson, Imperial Bank Chambers, Toronto, have prepared plans for the erection of a club building at Ottawa Country Club, on the Aylmer Road, near Ottawa.

Fort Erie, Ont.—Martin Nathanson, secretary of the new Niagara Jockey Club, states that the club will rebuild and enlarge the grandstand at Erie Race track. Other improvements include a new grandstand, stabling quarters for 500 horses, and the building of new track kitchens. The total expenditure will be at least \$35,000.

Montreal, P.Q.—Mr. Casey, manager of the Montreal Baseball team, states that plans and specifications will be prepared for the proposed new grand stand for the Montreal baseball grounds.

Halifax, N.S.—A company, composed of S. Penn, superintendent of the Direct Cable Co., of this city, and William S. Davidson, J. W. Regan, C. J. Silliker, Frank Colwell, George H. Carson and F. W. Bowes, all of Halifax, has raised the sum of \$5,000, of \$10,000 or \$15,000, which will be expended in the erecting of a yacht club house here.

Winnipeg, Man.—The Knights of Columbus and the Catholic Club, of this city, propose erecting a lodge building, to be equipped similar to the Y. M. C. A. building, at a cost of about \$10,000. The Archbishop of St. Boniface is strongly favoring the project.

Opera Houses and Rinks

Hagersville, Ont.—J. Lynch, Hagersville, Ont., has plans and specifications for the work of making a twenty-four foot addition to the present opera house, and putting in a plate glass front in the opera house block in this place.

Durham, Ont.—Mr. Jas. A. Brown, of this place, intends erecting an up-to-date rink here this coming summer. Plans will be completed in the near future and tenders invited.

Owen Sound, Ont.—Architects Forster & Clark, of this place, have prepared plans for remodeling the interior of the present town hall here into an opera house to seat 800 people.

Montreal, P.Q.—A. A. Christin, of the Montclair A. A. of Montreal, has had plans prepared for a circular pavilion to be used as a roller rink in the summer and a skating rink in the winter. The structure is to be erected on the north side of St. Catherine Street, just east of Arwater Street.

Vancouver, B.C.—Messrs. Heers & Trippie, Chicago, Ill., have purchased the property now occupied by the Merchants Bank on Carroll Street, Vancouver, on which they propose erecting a skating rink. The structure is to be erected on the north side of St. Williams, of this city.

Asylums and Hospitals

Toronto, Ont.—Controller Harrison, of the Toronto City Council, has arranged for a conference of the managements of the Western Hospital and Grace Hospital, for the purpose of considering the amalgamation of the interests of two hospitals with a view of building a large new hospital on the site of the Western Hospital on Bathurst Street. If the proposition is accepted the city will grant \$100,000, which, with the proceeds from the sale of the present hospital buildings, and amounts raised by subscription, will enable them to erect a modern hospital, to cost in the neighborhood of \$200,000. Controllers Harrison, Lucken and Ward are interested in this proposition.

Toronto, Ont.—Mr. Gunther, superintendent of the House of Refuge for Weak-Minded Girls, on Belmont Street, has asked the City Council for a grant of \$5,000 to build a stone wall around the grounds of the institution. The trustees of the home propose spending \$8,000 in enlargements and improvements.

London, Ont.—Alderman Stewart, Chairman of the Special Hospital Committee, London, Ont., has prepared plans and specifications for the proposed Isolation Hospital, to be erected here, have been completed.

Welland, Ont.—Architects Ellis & Conroy, Manning Chambers, Toronto, have prepared plans for a hospital building to be erected at Welland, Ont. Specifications included: linoleum covering over hardwood floor in operating room. Separate tenders for slate shingles, or galvanized metal roof, and heating system. The hospital board is composed of W. E. Phin, president; Dr. Colbeck, secretary; Dr. Garned, A. O. Beatty, M. McAniffie, A. Griffiths and Mayor Cress.

Winnipeg, Man.—Architects Hooper & Walkers, Winnipeg, Man., have prepared plans for an addition to the St. Joseph's Orphanage building, erected last year, to consist of a public hall and dormitory.

Schools and Colleges

Toronto, Ont.—The trustees of Knox College propose, in the near future, calling for competitive designs for the proposed college building to be erected on University Lane, at a cost of \$400,000. The structure will be of the Norman style of architecture.

Toronto, Ont.—The Board of Education, of the City of Toronto, proposes erecting a six-roomed addition to the present Fern Avenue school in the near future. The Bishop City Hall, is the Superintendent of School Buildings.

Ottawa, Ont.—The Public School Furnishing Committee, of the Ottawa Board of Education, estimates that it will require to expend the sum of \$25,000 in additions and furnishings.

Dover Centre, Ont.—Architect A. M. Piper, Chatham, Ont., has prepared plans for the remodeling and underpinning of a school building at Dover Centre. Specifications include cement work, cut stone, brick, metal ceiling.

Wallaceburg, Ont.—Architect E. B. Arnold, Chatham, has prepared plans for a convent to be erected for the Roman Catholic congregation at Wallaceburg early this spring. The structure will be of brick and stone, and modern in every respect.

Woodstock, Ont.—The Board of Education have decided to call for plans for an eight-roomed school building to be erected in the west end. As soon as the plans are prepared and approved, the work will be invited.

Belleville, Ont.—Architect Colborne P. Meredith, Sparks Chambers, Ottawa, Ont., has prepared plans for a school to be erected for the Rev. D. A. Twomey, Belleville, Ont. It will be a two-story building, with structure, provided with steam heating, electric lighting, cement foundation, cut stone, sheet metal work, metal ceiling and prismatic glass.

Fruitland, Ont.—At a meeting in the office of E. D. Smith, W.P., at Winona, Mr. Miller, Reeve of Fruitland, Ont., and others, decided to call for plans for the election of a suitable school at Fruitland, Ont.

Trorton, Ont.—The primary school, of the town of Trorton, Ont., was recently destroyed by fire, entailing a loss of \$3,000. It will be rebuilt.

London, Ont.—Architect Wm. G. Murray, Masonic Temple, London, Ont., has prepared plans for a school for school section No. 9, London Township, to be erected in brick construction, with cement foundation, slate roof, hot air heating. The building will seat thirty-five pupils.

London, Ont.—Architect Nutter, London, Ont., has prepared plans for an addition of four rooms to Lorne Avenue School, the installation of a hot water system of heating, and also the installation of a hot water heating plant in the Talbot Street School.

Niagara Falls, Ont.—Lieutenant Colonel Crinkshank, Chairman of the Public School Board, Niagara Falls, Ont., has had plans and specifications prepared for the erection of an addition to the Collegiate Institute here. It will be a one-story brick structure, 75 x 85 feet in dimensions, having a steel trussed roof.

Halleybury, Ont.—Architect A. D. Pillar, Halleybury, Ont., has prepared plans for the erection of a public school at this place. J. L. Rankin is Secretary of the School Board.

Hamilton, Ont.—Architects Stewart & Witton, Hamilton, Ont., have prepared plans for an addition to the Sophia Street school, to cost about \$30,000. The addition will contain eight extra rooms.

Bridgeburg, Ont.—On the recommendation of A. A. Coulthurst and F. W. James, of the School Board of Bridgeburg, the City Solicitor of this town has been instructed to prepare a by-law, authorizing the expenditure of \$6,000 for the purpose of building a two-room addition to Phipp Street school.

Welland, Ont.—Architects Ellis and Conroy, Manning Chambers, Toronto, have prepared plans for a two-story addition, 35 x 33 feet, to be erected to the public school here. Mr. McCaw is Secretary of the Welland School Board.

Brockville, Ont.—The following contracts have been awarded in connection with the improvements and additions to the Collegiate Institute at this place: Anderson & Street, masonry; Harvey Dunham, carpenter and mill work; Brown & Temple, heating and plumbing. The total cost of the work will be about \$17,000. All the above firms are located in Brockville.

Hamilton, Ont.—The Building Committee of the Board of Education of Hamilton, Ont., have recommended the expenditure of \$10,000 for the erection of an addition to the Sophia Street school.

Stratford, Ont.—Architect W. J. Ireland, Stratford, Ont., has completed plans for a public school building, at a cost of about \$60,000. Specifications include concrete foundation, stone and brick superstructure, slate roof, steam heating, electric lighting, complete plumbing, hardwood interior finish, sheet metal work, metal structure, sheet metal work, metal ceilings, electrical work and plate glass.

Hochelega, Montreal, P.Q.—Architect Jos. Venne, 402 Pleiniss Street, Montreal, P.Q., has prepared plans and will receive tenders in the near future for the erection of a school building for the Roman Catholic School Commissioners, Hochelega, Montreal. Specifications include cement work, cut stone, brick, terra cotta, tile, terrazzo, concrete, armor-plated iron, structural iron, ornamental iron, electrical work. Separate bids will be received for fireproof concrete construction and terra cotta fireproof construction.

Montreal, P.Q.—The building of the Sisters of Providence, on St. Hubert Street, this city, was recently damaged by fire to the extent of \$10,000. Loss is covered by insurance, and the damage will be repaired at once.

Lennoxville, P.Q.—The corporation of Bishop's College, Lennoxville, P.Q., propose having plans prepared for an extension to be here to the college here, at a cost of about \$10,000. Rev. Dr. Alant is the principal.

Fraserville, P.Q.—Architects Ouellet & Levesque, 117 St. John Street, Quebec, P.Q., have prepared plans and will receive tenders for the construction of two school buildings for the School at Fraserville, P.Q. Specifications include stone foundation, artificial stone superstructure, galvanized iron roof, modern plumbing, hot air heating, plaster interior finish, structural iron and cut stone.

Wolfville, N.S.—A committee, composed of President Hutchinson, Prof. F. R. Haley, E. B. Oakes, C. R. H. Starr, Prof. Ernest Hay-

cock, A. Cohoon, and E. N. Rhodes, of Rhodes, Curry & Co., of Halifax, N.S., has been chosen to secure a site and plans for the proposed Acadia College building, which is to be erected at a cost of about \$100,000.

Halifax, N.S.—The School Board, of this city, has decided not to rebuild the Compton School, recently destroyed by fire, but to erect a new building to cost about \$35,000 on a lot purchased from the City of this city, situated on Chebucto Road. The City Council will be asked to issue debentures covering the cost of the school site and building. It is expected that plans will be prepared in the near future.

Winnipeg, Man.—At a meeting of the Board of Directors, it has just been decided to erect a women's building in connection with Wesley Methodist College in Winnipeg, at a cost of \$100,000.

Kildonan, Man.—Architect Victor H. Horwood, Winnipeg, Man., has prepared plans for a two-story four-room schoolhouse of solid brick, to be erected in the town of Kildonan. Work on this structure will start in the spring.

Moose Jaw, Sask.—At a meeting of the School Board of this place it was decided to issue debentures to the extent of \$100,000 for the purpose of erecting a Collegiate Institute. The Board consists of Mayor Bogue, Hugh McKeller and Harold Jagger.

Star City, Sask.—Leo Warlofig, secretary-treasurer Star City, Sask., will receive tenders until March 15th for the erection and opening of a schoolhouse for district No. 1408, Excelsior.

Summerberry, Sask.—Architect Victor M. Horwood, Winnipeg, Man., has prepared plans and will shortly receive tenders for the construction of a two-story four-roomed solid stone schoolhouse to be erected in Summerberry, Sask.

Humbolt, Sask.—Architect W. W. LaChance, Saskatoon, Sask., has prepared plans for a two-story school to be erected at Humbolt, Sask. Specifications include concrete foundation, frame superstructure, shingle roof, hot air heating, plaster interior finish, slate blackboards. Estimated cost, \$3,500.

Vermilion, Alta.—The School Board of Vermilion, Alta., has solicited tenders for the erection of a two-story schoolhouse to the extent of \$25,000, for the purpose of erecting an eight-roomed solid brick schoolhouse early in the spring.

Edmonton, Alta.—Roland W. Lines, architect 25 Jasper Avenue West, Edmonton, has prepared plans for the erection of a large school in Norwood, a suburb of this city, for the Protestant school trustees.

Edmonton, Alta.—Alex. Taylor, member of the School Board of this city, states that the Board has decided to advertise for tenders at once for the erection of the proposed Normal School here.

South Vancouver, B.C.—The Public School Board of South Vancouver, B.C., propose erecting three schools early this spring, at a total cost of \$9,000.

Victoria, B.C.—Architect F. N. Rattenbury, Victoria, B.C., has prepared plans for a school and municipal hall, to be built at Oak Bay, a suburb of Victoria. It will consist of a two-story and basement structure, and will cost \$6,000. A steam heating plant will be installed.

Churches

Toronto, Ont.—The congregation of College Street Methodist Church have decided to build an addition to the church and make alterations at a cost about \$20,000.

Toronto, Ont.—The Westmoreland Methodist Church, recently destroyed by fire, will be rebuilt at a cost of \$40,000. This project is being supported by the Methodist Social Union of Toronto.

London, Ont.—F. W. Mallott, pastor of the Colborne Street Methodist Church, London, Ont., states that work will shortly commence on a \$15,000 addition to the church.

Valley Town, Ont.—The Board of Trustees of Knox Church here have decided to erect a Sunday-school building in connection with this church. The plans will be prepared shortly so as to start building operations early in the spring.

Derwent, Ont.—The parishioners of the Salem Church at Derwent, Ont., propose to erect a cement work church, to seat 400 people, at a cost of between \$7,000 and \$10,000. At the present time \$4,500 has been subscribed towards the project.

Hamilton, Ont.—The trustees of Herkimer Street Baptist Church, Hamilton, propose erecting a new church in the near future to cost \$20,000.

Fort William, Ont.—The sum of \$21,000 has been subscribed towards the church to be erected at Fort William, Ont., for the Presbyterian congregation. It is expected that active building operations will be commenced in the near future.

Corwall, Ont.—Architect Jos. Venne, 402 Pleiniss Street, Montreal, has prepared plans for the intended reconstruction of a church at Corwall, Ont., and has awarded the contract for same to Paquette & Godbout, St. Hyacinthe, P.Q.

Lucan, Ont.—The congregation of Holy Trinity Church, Rev. Fr. O'Riordan, pastor, at Lucan, Ont., has decided to erect a new church in the spring to cost \$10,000. Plans have not yet been prepared, but they will be put in hand at once.

Ottawa, Ont.—The City View Methodist

Church, five miles from Ottawa, was burned to the ground recently, entailing a loss of \$4,000, with insurance of about \$2,000. Rev. H. A. Young, the pastor, states that the church will be rebuilt at once.

Montreal, P.Q.—The Board of Trustees of the German Lutheran Church, Montreal, has purchased a site on the corner of Blaince and Prince Arthur Streets, on which they propose to erect a church early next spring. Plans will be prepared at once. The lot is 90 x 70 feet in dimensions.

Matane, P.Q.—Architects Onelleite & Levesque, 117 St. John Street, are preparing plans, and will receive tenders about April 15th for a church for the parish of Matane, St. Agde County, P.Q., to cost \$40,000. The structure will be 140 x 60 feet, stone foundation, stone superstructure, galvanized iron roof, plaster interior finish. Material used: cut stone, marble, brick, sheet metal work and heating system.

Katevale, P.Q.—Verret & Desautels, Sherbrooke, P.Q., have been awarded the contract for the erection of a Roman Catholic Church in Katevale, P.Q., in a contract price of \$20,650.

Winnipeg, Man.—Architects Smith & Bruce, of this city, are contemplating plans for additions to St. Stephen's Church here, to accommodate 1,500 people.

Lumsden, Alta.—The Methodist congregation, of this place, are considering the erection of a church here, according to plans which they have drawn up. The secretary of the Building Committee of the Methodist Church, Lumsden, Alta., will have full particulars.

Lake Valley, Sask.—W. H. Moon, secretary treasurer Lake Valley, Sask., will receive tenders until February 23rd, for the erection of a Methodist Church at Lake Valley, according to plans with Mr. Dowson Caron, Sask., church to be completed by July 1st, 1908.

Winnipeg, Man.—The members of the Congregational Church, Winnipeg, Man., have purchased a lot on the corner of Preston and Home Streets, Winnipeg, which they propose erecting a church building.

Residences and Flats

London, Ont.—Architect Wm. G. Murray, Manic Temple, London, has prepared plans for a two-story and attic brick dwelling to cost \$4,000, for Mr. C. Currie, 37 Stanley Street, London, Ont. Specifications include brick foundation, brick superstructure, slate gas and electric lighting, cement work, mantels, concrete blocks.

London, Ont.—Architect Edward Wright, 461 Dufferin Street, London, has prepared plans for a two-story brick residence, to be erected for H. C. Wildermuth, Princess Ave. Specifications include concrete foundation, shingle roof, oak and pine interior finish, hot water heating, electric lighting, modern plumbing, mantels, single stair, ornamental columns and caps, plate glass.

Hamilton, Ont.—Architect E. R. Patterson, 167 1/2 East King Street, Hamilton, has prepared plans for a brick residence, to be erected on Fairleigh Avenue, for George H. Hopkins. The building will be equipped with electric and gas fixtures, mantels, ornamental columns and caps.

Ottawa, Ont.—Architect W. E. Noffke, 26 Central Chambers, has prepared plans for a \$9,000 residence on Government Driveway for W. D. Morris. It will be of brick construction, with pine and oak interior finish, hot water heating, electric lighting, modern plumbing, mantels, single stair, art glass, work to be commenced early in spring.

Ottawa, Ont.—Architect W. E. Noffke, 26 Central Chambers, Ottawa, has prepared plans and will shortly call for tenders for the erection of a cottage for Ronald H. McLean, Ottawa, to cost \$4,000. The structure will be of stone, with stained shingle roof, oak interior finish, modern plumbing, hot water heating, electric lighting, art glass and brick mantels.

Ottawa, Ont.—Architects Bayley & Huber, 59 Metcalfe Street, Ottawa, Ont., have prepared plans and will receive tenders about March 15th, for an apartment house for St. Roman and Grass. The building will be of brick and frame construction, with high concrete foundation, felt and gravel roof, hot water heating and electric light.

Guelph, Ont.—Architect W. Frye, Colwell P.O., Box 615, Guelph, Ont., is preparing plans for a residence to be erected for T. Holliday, Guelph, at a cost of \$7,000. It will have stone foundation and stone superstructure, combination heating, mantels, artificial stone, art glass.

St. Mary's, Ont.—Architect W. Fletcher Shepherd, London, Ont., has prepared plans for a residence to cost \$5,500, for J. Walton Peart, St. Mary's, Ont. It will be of brick construction, with stone foundation, slate roof, hardwood interior finish, hardwood doors, hot water heating, electric lighting, separate bath and closet. Specifications include cement work, cut stone, tile, mantels, structural iron, sheet metal work, electrical

work, plate glass, art glass, refrigerator. A septic tank will also be installed at the rear of the house.

St. Andrews, N.B.—Architect F. Neil Brodie, 42 Princess Street, St. John, N.B., has prepared plans for a \$10,000 residence for Thomas Odell, St. Andrews, N.B., to be erected by day work. It will be two and one-half storeys high of brick and stone construction, with steel shingle roof, hot water heating, electric lighting, open plumbing, hardwood interior finish.

St. John, N.B.—Architect F. Neil Brodie, 42 Princess Street, St. John, N.B., has completed plans for the erection of a \$6,000 residence for J. S. Smith, St. John, N.B. The structure will be two and one-half storeys high of frame, with concrete foundation, shingle roof, eypress interior finish, hot water heating, electric light, open plumbing.

Glouce Bay, C.B.—Wm. Curry, Glouce Bay, has been awarded the contract for the erection of twenty-five houses at this place for miners employed by the North Atlantic Colonies Co. Construction work will start in the spring, and it is probable that another twenty-five houses will be contracted for as soon as they are finished.

Winnipeg, Man.—The North-West Land and Business Exchange, composed of C. T. Iyer, L. A. Lewis and David Reid, represent a firm of capitalists which proposes erecting three apartment buildings, one on each of the following streets, Broadway, Appelle Avenue and Notre Dame Avenue.

Vancouver, B.C.—Architects Hooper & Watkins, Hastings and Homer Streets, Vancouver, B.C., have prepared plans for a seven-story structure, to be used as a store and apartment building, for Hugh Springer, of this city. The building will contain 110 rooms, in suites, and eighty-four bachelor apartments, with bathrooms attached to each suite. It will be of fireproof construction, reinforced concrete, steel frame, tile floors and tile dado walls, brick and stone front. Each apartment will be lighted by electricity on a battery 35 feet long and 7 feet wide. The structure will be erected by a company which Mr. Springer is organizing.

Hotels

Dresden, Ont.—The Clifford House, owned by Allan McIntosh, Dresden, Man., was recently destroyed by fire, entailing a loss of \$9,000. It will likely be rebuilt.

London, Ont.—Mr. George O'Neill will erect a fifty-room addition to the Teromsh Hotel, of which he is the proprietor. This work is to be finished by early summer.

Winchester, Ont.—The Winchester Hotel Co. of Winchester, Ont., has been formed with a capital of \$40,000 for the purpose of building a hotel here to replace the two structures recently destroyed by fire.

Halifax, N.S.—S. M. Brookfield, Ltd., Halifax, N.S., has been awarded the contract for erecting an addition to the Queen's Hotel, owned by Jas. P. Fairbanks, of this place. Architect G. H. Jost, 28 Sackville Street, Halifax, N.S., prepared the plans. Contract price is \$50,000. Specifications include: concrete and stone foundation, fireproof, steel and concrete superstructure, gravel roof, oak and chestnut interior finish, hot water heating, electric lighting, modern plumbing, brick, tile, mantels, fireproofing, metallic lath, structural iron, plate glass, art glass. Floors and ceiling of dry stone to be of expanded metal and concrete.

Carberry, Man.—W. A. Bannister proposes erecting a hotel, 75 x 65 feet, three-storeys high, early this spring. Plans are being prepared and tenders will be invited in the near future.

Winnipeg, Man.—Architects Hooper & Watkins, Winnipeg, Man., have prepared plans for a three and one-half storey, 100 x 126 feet, frame hotel on concrete foundations, to contain eighty guest rooms. E. Winderbank, manager of the Manitoba Club, is the party who will erect the building.

Fernie, B.C.—Contractor Stafford, Fernie, B.C., will erect twenty cottages at Hosmer, B.C., near this place. The brick and plastering work has been sublet to L. O. Kummer, Fernie, B.C.

Lambton, Sask.—Architect W. W. LaChance, Saskatoon, Sask., has completed plans for a hotel to be erected at Lambton, Sask., at a cost of \$15,000.

Fire Stations and Jails

Toronto, Ont.—Chief Thompson, of the Fire Department, Toronto, has recommended to the Fire and Light Committee and City Council the erection of three new fire halls.

Toronto, Ont.—The Gamewell Fire Alarm Telegraph Co. of New York City, was awarded a contract by the Board of Police Commissioners for the installation of an enlarged signal system, to cost \$10,000, in Toronto.

Niagara Falls, Ont.—Architect William Nichols, Niagara Falls, Ont., has prepared plans for an addition to and remodeling of the fire hall at the south end of this city.

Branford, Ont.—Chief Lewis, of the Fire Department, Branford, has recommended to the Council the purchase of a fire engine, for the use of the department.

Hamilton, Ont.—As soon as the beach pumping plant is installed at Burlington Beach, the Council of the City of Hamilton, Ont., proposes erecting a fire hall and installing suitable fire apparatus therein for the protection of Beach residents.

Montreal, P.Q.—Superintendent Fernus, of the Fire Alarm Department, of the City of Montreal, has asked for \$12,000 for the purpose of installing a new fire alarm system. The Fire and Light Committee has decided to ask the Finance Committee to make the appropriation.

Moosomin, Sask.—Architects Darling & Pearson, Winnipeg, Man., have prepared plans for a jail to be erected here, for the Province of Saskatchewan, at a cost of \$50,000. Plans call for fire proof structure, with 40 cells, quarters for governor and guards, bathrooms, shower baths, chapel, laundry, hospital, etc. The walls of the cells, trimmed with stone. Reinforced concrete will be used throughout. Every cell will have toilet equipment, steel beds and direct ventilation.

Lethbridge, Alta.—The Council of Lethbridge, has decided to erect a fire hall here and install fire apparatus therein, at a total cost of \$20,000. The work will be undertaken at once.

Saskatoon, Sask.—Architect W. W. LaChance, Regina and Saskatoon, Sask., has prepared plans for the erection of a fire hall at this place to cost \$12,000. The building will be two-storey high of brick construction, with stone foundation, composition roof, steam heating, electric lighting, modern plumbing, cut stone, metallic lath, structural iron and ornamentation.

Victoria, B.C.—Alderman Fullerton, chairman of the fire wardens of this city will recommend to the city Council the expenditure of \$25,000 on new fire apparatus, and a general overhauling of the plant, the erection of two new fire halls to cost about \$5,000 each, and the purchase of a new chemical engine and hose reel combined, to carry 400 feet of hose and two 50-gallon tanks.

Cement Blocks in Japan

It would appear, from the tone of a recent communication to the Department of Trade and Commerce, Washington, that there is some opportunity for the introduction of machinery for the manufacture of concrete blocks in China.

At the present time houses are constructed there from bricks locally manufactured and are generally covered with plaster or stucco. Red bricks are manufactured by the natives and are very rough and porous. They sell at about \$1.50 per thousand. What are known as "blue" bricks, sun dried, sell at \$4.50 per thousand. A better quality brick is manufactured in foreign factories, of which there are two in Fuzhou, at about \$7 per thousand. Practically all of the houses occupied by Europeans here are made from these foreign manufactured bricks. The clay, sand and other materials are obtained locally. Framework for buildings is almost entirely of wood. Steel and iron has to be imported and is very expensive. Lumber sells at high prices and is all imported. Pine from America, generally preferred for interior work, sells at \$13.50 per cubic meter (cubic meter = 1.35 cubic feet). Japanese pine can be obtained for \$7.50 per cubic meter and Japanese hard woods at \$8.50. Korean wood and wood imported from Manchuria through Newchwang is also used to a considerable extent, but it is generally conceded that the American woods are the best for general use. There are several large firms engaged in this work, and large quantities of American lumber can always be seen in the wood yards of this city.

The government buildings and the better class of large buildings are built of stone, locally quarried. Stone of the better class can be obtained on the spot at about 75 cents per cubic meter, second quality at 60 cents per cubic meter, and third quality, known as gravel, at 50 cents per cubic meter. Sand is available at 40 cents per cubic meter. Lime costs \$2.50 per 1,000 pounds. Cement, which comes in casks from Germany, sells at \$2.50 per cask. Nails cost \$1.25 per 100 pounds. With an agent on the spot there should be an excellent opportunity to introduce the reinforced concrete buildings, or structures constructed of cement blocks. These structures would withstand the excessive changes of weather and heavy rains better than brick formations, and the steel construction would make for strength to withstand the heavy windstorms prevalent throughout China.

Prices of mechanics are as follows: Carpenters, stonecutters and masons, each 40 cents a day; tinners, 50 cents; blacksmiths, 35 cents; painters, 25 cents; and coolies, that is, hod carriers, etc.—12 1/2 cents. The best method of introducing goods is by personal representative.

Sand-Lime Brick Introduced in America 40 Years Ago

WHILE the manufacture of sand-lime bricks has been generally considered a new industry in the United States and Canada, it will interest some people to learn that there are buildings in the upper peninsular of Michigan which were erected forty years ago of this product. The bricks in these structures were manufactured at Marquette at a plant erected on the lake shore near Little Presque Isle. The factory was built by Cornelius Donkersley and S. P. Sly. The latter was then vice-president of the old Marquette, Houghton and Ontonagon Railroad Co. and at the head of several mining companies. Being a great traveller, it was on one of his trips to Europe that he learned of the method of making brick from sand and lime, and while in Germany he visited several plants and investigated the process of their manufacture. Returning to Marquette, a plant was erected and operated a number of years.

The machinery at that time was crude and the process of making the bricks slow. The bricks were not steamed, but were laid carefully in the sun to harden. In putting them in a building they had to be carried on a pallet. The bricks were large and cumbersome, weighing as much as four ordinary bricks. To-day these same bricks are as hard as granite blocks. The crude and slow method of manufacturing them and the low price of timber resulted in the closing down of the plant. Among the buildings which are now standing are the Presbyterian Church, on Front street, Marquette, which was built thirty-nine years ago, and the roundhouse of the old Marquette, Houghton and Ontonaga Railroad, which was many years ago absorbed by the Duluth, South Shore and Atlantic Railway.

During the two score years which have elapsed since the establishment of the factory at Marquette, the industry has made great strides in Germany, and has grown very fast in this country since first introduced into America about six years ago.

However, the success of the sand-lime brick depends on the proper proportioning of the aggregates which constitutes it. Not only must the ingredients be properly mixed, but a uniform mix should be obtained at all times. The absolute necessity of this feature has led to the adoption of mechanical means of proportioning to procure the desired results. One of the most perfect methods devised for the manufacture of this product is known as the Schwarz system, of which the Scientific System Brick Company, 79 Adelaide street east, Toronto, are the Canadian agents. By the use of their preparing machine, it is claimed, a better brick and a more uniform product can be obtained than by any other system.

A Well-Known Building Supply Firm

ONE of the best known dealers in building supplies in the Dominion is E. F. Dartnell, 157 St. James street, Montreal. During the past year this concern has done a larger volume of business than ever before, and at the present time is enjoying a steadily increasing patronage among builders and owners throughout the country. The line of materials carried by this firm is most complete and its prices are compatible with the various products and different grades of goods to be found in stock. In brick alone, the line comprises pressed brick, plastic vitrified brick, enamelled brick, fire brick, paving brick and

common brick. All colors common to burned clay, in Standard, Roman, and Norman sizes can be obtained.

Moulded shapes for arcades, column, loggias, circular piers, doorway and arch entrances, architraves, window arches, etc., will be made to special order. Among the specialties supplied by this firm is the Parker Steel Corner Plate for the protection of plastered corners. This device has been specified by many of the leading architects in designing some of the largest office building and other structures on the American continent. It not only outlines a perfect corner but pays for itself many times in the saving of repairs.

Besides the above products, other lines to be found in stock includes ornamental terra cotta, terra cotta fire-proofing, fine building stones, glass tile, concrete mixers, concrete block machines, R.I.W. Damp Resisting paints, etc., etc. Descriptive matter, price lists and estimates will be furnished upon request by addressing E. F. Dartnell, 157 St. James St., Montreal.

A Jointless Flooring

THERE is undoubtedly no flooring adopted in modern construction that has met with greater universal indorsement than has been accorded to Doloment. Since its introduction a few years ago to the building public, innumerable testimonials from leading architects and engineers, as well as owners, attest to the fact that the merits of this product are all that is claimed for it.

Doloment is a material that offers many special advantages. It has overcome the difficulties experienced by architects in finding a jointless flooring which is cheap, durable and effective, and which neither cracks nor bulges. From an hygienic viewpoint, Doloment, being absolutely non-porous, and, therefore, impervious to liquids, dust, insects, etc, takes precedent over all other kinds of flooring.

Other features of this product are its elasticity, water-proof qualities and non-inflammable character, the last two features procuring for the owner a reduced rate of insurance. Doloment is laid in a double layer, of a total thickness of 3/4-inch, which enables the manufacturer to absolutely guarantee it against cracking or bulging, which has been a great drawback to all jointless floors in the past.

It can be made in almost any color or finished in designs to imitate granite, mosaic, or marble. Owing to its deadening effect on sound it is particularly adapted for use in churches, schools, universities, auditoriums and flats, and being without seams, it naturally counteracts the dangers from bacteria, and is, therefore, indispensable in hospitals, asylums, factories, barracks, theatres and like structures.

Although Doloment was invented but three years ago, it commands to-day an unprecedented sale on the Continent, and has received the highest awards at the Art Exhibition, Dresden, July, 1906, and at the Hygienic Exhibition, Vienna, September, 1906. It is said to be the only jointless flooring that is fully protected by patents in all countries.

While Doloment, when first brought to the notice of the Canadian architects, was generally conceded to be a desirable flooring, some doubt was expressed as to whether it would withstand the rigors of a Canadian winter. In order to prove that frost is not injurious to this flooring, the company laid an outdoor verandah floor at the new residence of Mr. George Summer, Montreal, and

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also at the residence of Mr. Chester D. Massey, Wellesley street, Toronto, both of which are in a perfect state, without a crack, bulge or blister, a fact which demonstrates that Doloment can adapt itself to the most trying climatic conditions. It can be laid on any surface, whether concrete, cement or wood.

In all cases where Doloment has been laid on good foundations it has proven a highly satisfactory flooring. It is not required that the foundation be smooth: all that is necessary is that it be level. The company has established extensive works at London, Paris, Vienna, Amsterdam, St. Petersburg, Berlin, New York, Buenos Ayres, Montreal and Toronto. For further information, estimates, testimonials, etc, address the Colonial Doloment Company, Limited, Mark Fisher Building, Victoria Square, Montreal, Canada.



An Instructive Cement Catalogue

WE are in receipt of a booklet, recently published by the Canadian Portland Cement Company, Limited, of Toronto and Montreal, which is highly illustrated with half-tones showing various buildings and structures in the Dominion, in which Star Portland Cement has been used. Notable among these are the head offices of the Bank of Montreal, the lighthouse at Port Colborne, Ont., in the throes of a severe storm; the Messrs. Clarke & Clarke's new leather factory, Toronto; the Trinity Methodist church, Napanee, Ont.; the undamaged piers of the Quebec bridge after its fall; and a panoramic view of the plant of the Canadian Niagara Company, Niagara Falls, Ont.

The works of the Canadian Portland Cement Company, located at Marlbank and Port Colborne, Ontario, have an annual output of 4,000,000 bags. During the past twenty years over 20,000,000 bags of "Star" brand have been used in hydraulic and other structural work throughout Canada, and it is claimed that no other brand of cement, domestic or foreign, can equal this record.

Cork Insulation

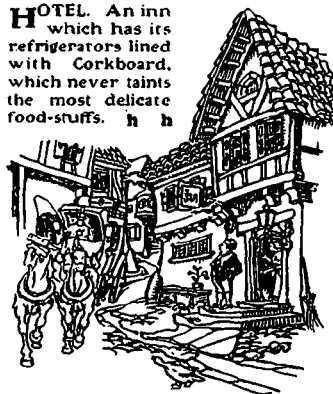
ARCHITECTS and others who are desirous of extending their vocabulary and who are incidentally seeking enlightenment on the subject of refrigeration should send for a copy of "Ye Dictionary of Sundry Facts Regarding ye Peculiar Substance yclept Corkboard," which has recently been issued by the Insulation Department of the Armstrong Cork Co., Coristine Building, Montreal.

The dictionary itself is a quaint brochure bound in a double brown paper cover on which is printed the title in black letters with red initials and a green and black marginal border. In general character and make-up it resembles the old English style of booklet and in every respect was cleverly conceived.

The lexicographer of the company has proven himself a philologist of no mean ability and unless he confines his efforts in this respect to the present edition, the works of Worcester, Webster and a few other authorities are liable

to become as obsolete as some of the words they contain. There is a touch of originality and humor in every definition and at the same time each term has a significance which aptly applies itself to "Corkboard" and the various purposes for which it can be used. As for instance:

HOTEL. An inn which has its refrigerators lined with Corkboard, which never taints the most delicate food-stuffs. h h



IC. Congealed H₂O manufactured in tanks surrounded with cork; stored in houses insulated with cork; used to cool things with cork stoppers. i i i i i i i i i i i i i i i i



MONTREAL. A city in Quebec. The capital of Corkboard's growing empire in the field of Canadian cold-storage insulation. Address Armstrong Cork Company, 521 Coristine Building. m m m m m

Besides this booklet, the Armstrong Cork Company has issued a number of other catalogues, profusely illustrated with high class half-tones, showing the practical applications of this product in different cold storage plants and other buildings throughout the country, and explaining its many economical and beneficial features. These catalogues will be mailed to anyone who is interested in refrigeration of any character.

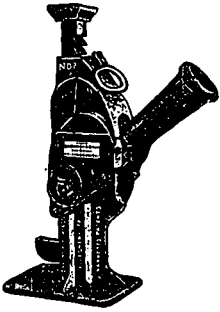
Dredges and Steam Shovels

SPECIMEN pages of the catalogue which is to be published shortly by M. Beatty & Sons, Limited, Welland, Ont., are at hand, giving us an excellent idea of the extensive field of industry in which the products of this firm are utilized. As manufacturers of dredges, steam shovels, locomotive cranes and derricks, M. Beatty and Sons need no introduction in the Canadian field. Within the past years they have furnished a great portion of the equipment which has been necessary in quarrying, bridge and dock building, pile driving and manufacturing and railroad work in the Dominion.

The company's new plant, occupying a site of nine acres on the Welland Canal, adjacent to the turning basin and wharf just completed by the Government, has about three times the capacity of their old works. It is complete in every respect and the equipment is thoroughly modern, including a number of new machines for doing large and heavy work. All the machinery throughout the works is electrically driven and five electric cranes for

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the quick and economical handling of material as well as to facilitate the loading and unloading of cars have been installed.

The location of the plant on the Welland Canal affords excellent advantages for dredge and scow building. It has its own launching slips, and two steel dredges and three steel scows are now in course of construction. A switch into the yards of the works provides splendid shipping facilities on the four railroads reaching that point. Nearly one mile of track is comprised in the company's private system, one track running the entire length of the machine shop enables cars to be run inside the shop when desired.

The company has recently acquired the right to manufacture the "Fairvette" Clam Bucket in Canada. This bucket is made for the U. S. trade by G. H. Williams Co., Cleveland, Ohio, and is claimed to be the fastest and most durable bucket on the market. As the company is selling these buckets at the same price as asked on the other side of the line, the Canadian customers will profit by the saving of duty.

With the greatly increased capacity and the economical facilities for doing work, together with the well known Beatty reputation for machinery that "Stands the Racket," the company is in a position to give prompt attention to all orders and assure early delivery to their customers.

The pages of the forthcoming catalogue are profusely illustrated with half-tones of the different types of dredges, steam shovels, derricks and cranes which have been constructed by this firm for various concerns throughout the country, in addition to cut showing the different styles of hoisting engines and various appliances used in work of the above character. The catalogue will also contain a number of drawings, explaining the different kinds of derricks and the principles on which they operate. When published, this catalogue will be sent upon request, by the company, to anyone interested in any of the foregoing lines.

Contractors' Supplies

A BOOK that is most consummate in its general make-up and one that should be of great value to contractors in every branch of work, is the catalogue published by F. H. Hopkins and Co., Montreal, successors to the late James Cooper. Every device and appliance known in the field of construction and industrial development is listed in its pages. Tools and machinery for every purpose, including steam shovels, dump cars, concrete mixers, rock crushers, locomotives, rock drills, hoisting engines, derricks, buckets, track supplies, iron and steel, represents only a portion of the exhaustive line carried by this firm. Railroad contractors' and mining supplies of every variety are to be found in stock. The company has also on hand a well assorted stock of second-hand plants, covering almost all the different lines required by contractors, on which prices will be cheerfully quoted to those who are interested in equipment of this character. The catalogue contains over 260 pages, profusely illustrated with high class half-tones and diagram drawings, showing various kinds of machinery and equipment supplied by this firm. It is printed on highly glazed paper and is substantially bound in a cloth covered press-board cover. Railroad contractors, mining companies and those generally engaged in the construction line will find this catalogue very convenient in looking up equipment and supplies necessary in their work. Price lists, estimates, etc., will be furnished by F. H. Hopkins & Co., Montreal, upon request.

Fireproofing Materials

ANOTHER bit of trade literature which has recently reached our files, is an interesting booklet issued by the National Fireproofing Company, with general offices in Pittsburg, Penn. The company manufacture terra cotta hollow tile fireproofing, and the object of this little publication is, as its title implies, to bring before the architect and builder, the "correct construction of fireproof buildings."

The booklet is a very neat and artistic production, embodying in its general character a decided element of refinement. It is printed on rough surfaced deck edged paper bound, with a heavy twisted silk cord. A series of "tipped" illustrations lends to the attractiveness of its pages.

These consist of colored plates showing typical shapes of terra cotta hollow tile blocks for floor and column protection, and perspective of typical floor arch, together with highly glazed prints of public buildings, business structures, apartment houses and residences in which this product is used either entirely or partly as a protection against fire. The booklet contains many valuable pointers on fireproof construction, and it is well worth the time of any architect or builder to peruse its contents.

Editor's Note

WE are in receipt of a communication from Architect Eden Smith, Toronto, which we regret arrived too late to be inserted in this issue. However, this letter, touching on the discussion which has arisen in these columns over the question of the "registration" of architects, will appear in the April number of CONSTRUCTION in the department devoted to correspondence.

Single Pipe Gravity System

(Continued from page 68.)

and if the branches when cold have only a slight fall, the result will be a pocket under the radiator when expansion has taken place, and as a result, water "hammer" will be frequently experienced.

Fig's 3 and 4 illustrate more clearly the way in which these connections should be made.

It will be noticed also that notwithstanding the use of a number of fittings on the branch, as indicated in Fig. 4, that the connection is not made on the side of the radiator nearest the riser, but is carried to the opposite side.

The reason for making the connection as shown, is because where the connections between a riser and the radiator, particularly where it is a small one, off the floor, instead of having the expansion compensated for, by swinging on the joints, whereas with the longer connection as shown, sufficient leverage is provided, so that a radiator, no matter how light, will be able to maintain its proper position.

Referring again to Fig. 1, it will be noticed that a check valve is placed on the return pipe near the boiler, and this valve should be of the ordinary "swing" pattern, and is useful only in case of an accident to any of that portion of the system below the water line, as for example, the breaking of a fitting, etc.

In such a contingency, the check would prevent the immediate escape of all of the water from the system.

A gate valve should always be placed between the check valve and the boiler, so that the latter valve may be taken out for repairs at any time, without removing the water in the latter.

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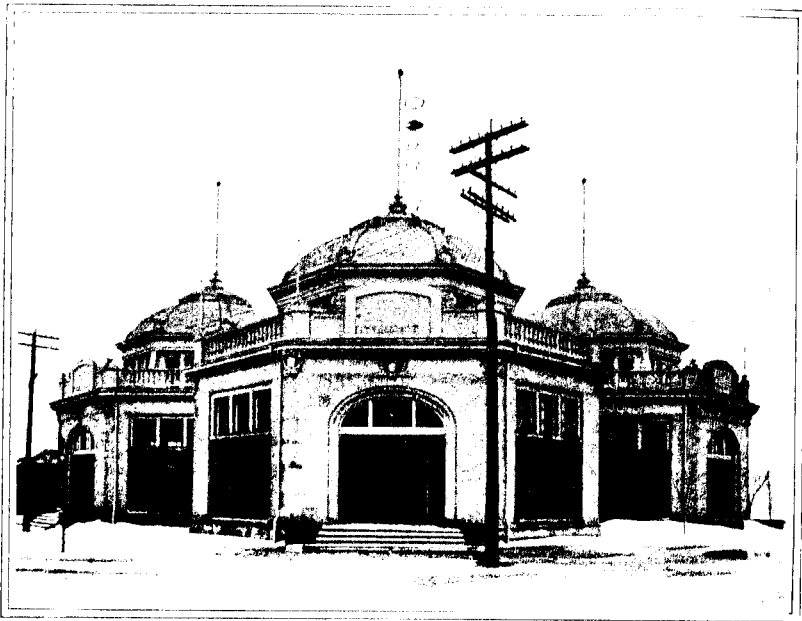
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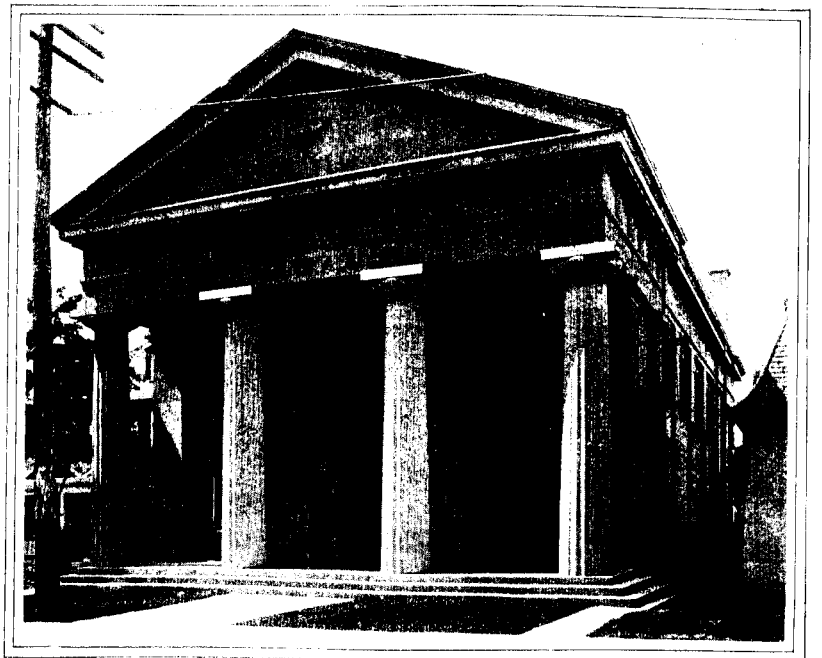
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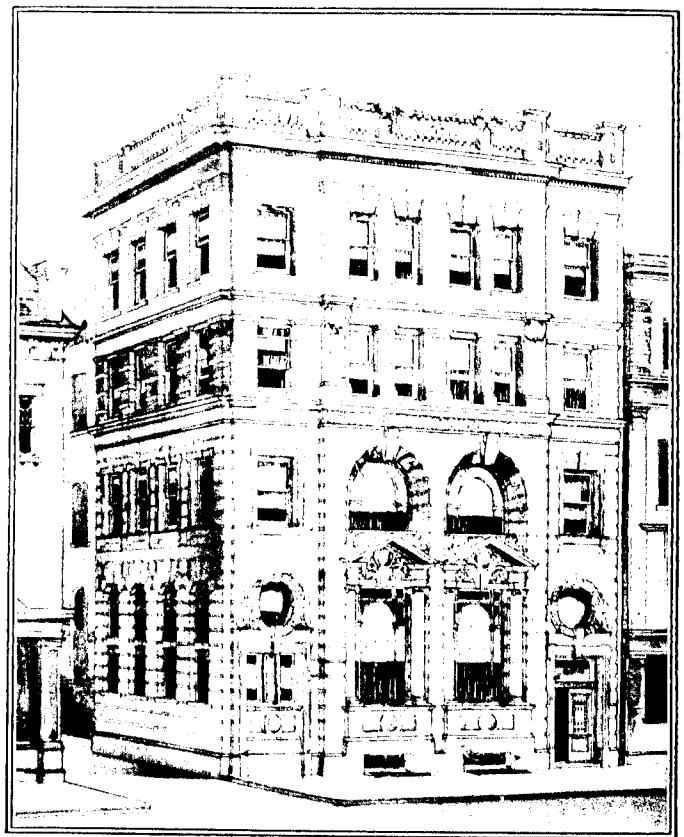
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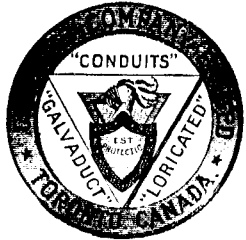
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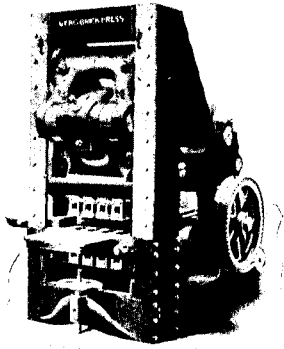
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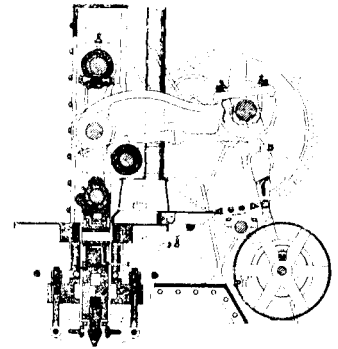
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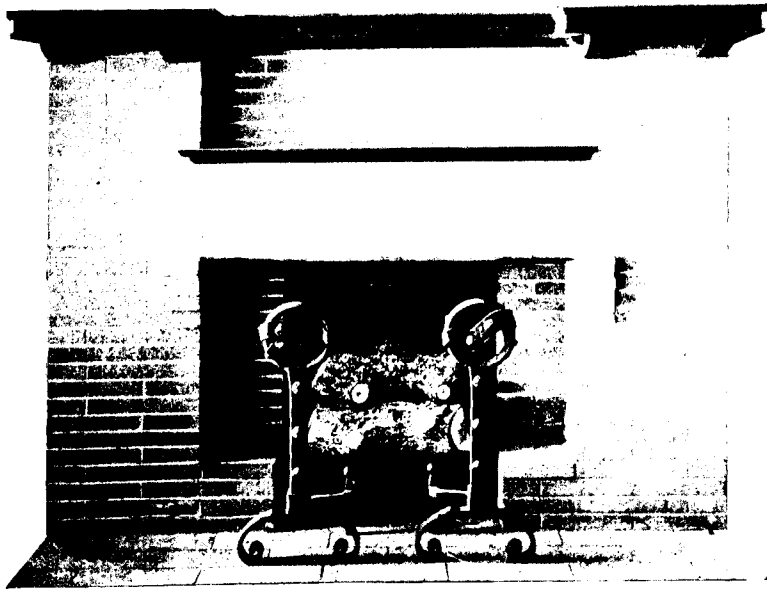
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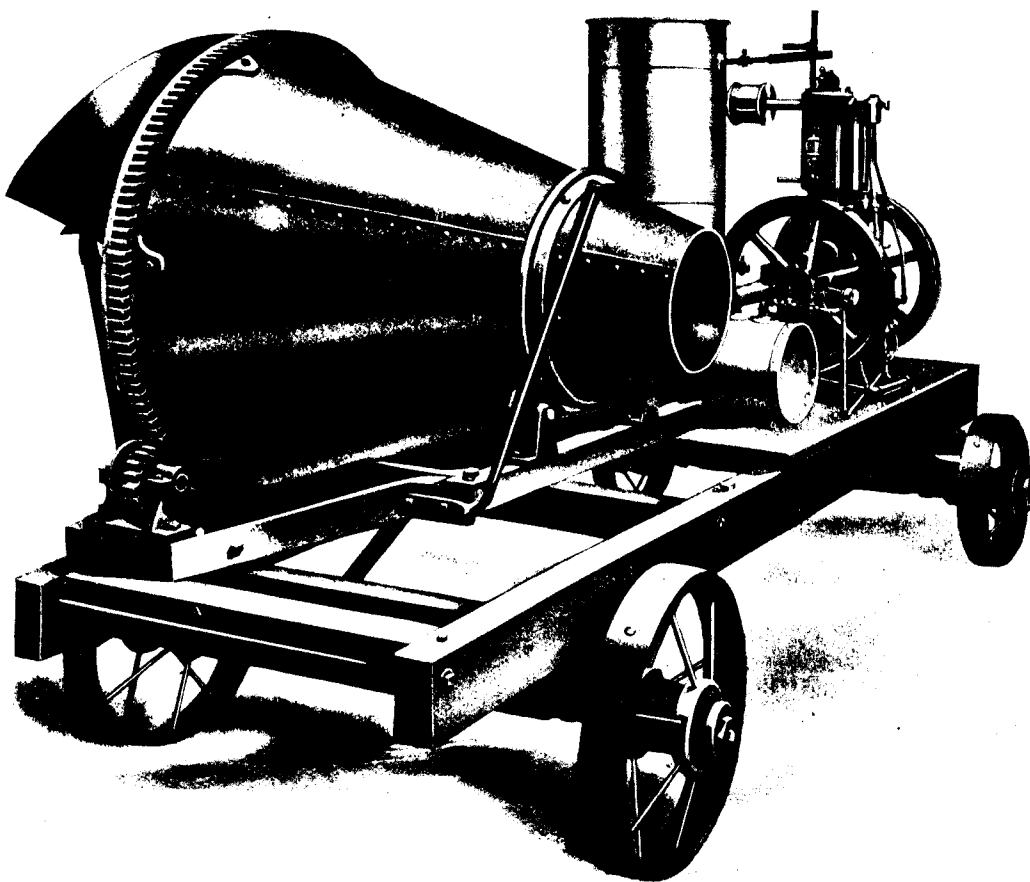
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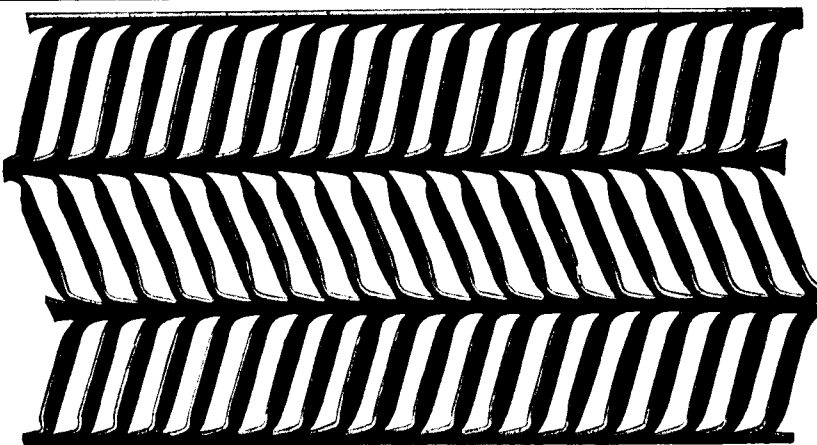
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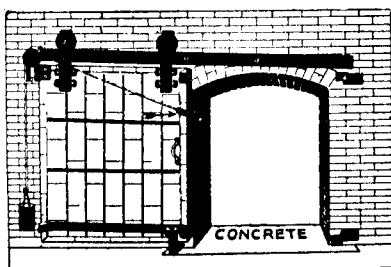
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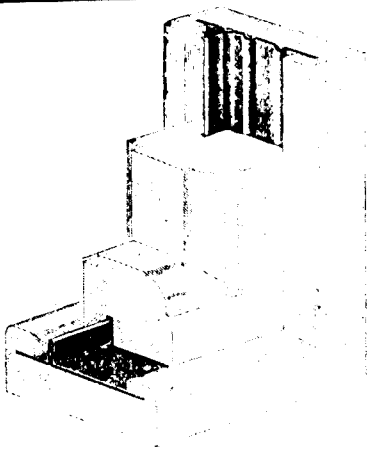
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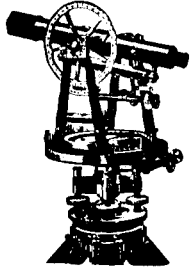
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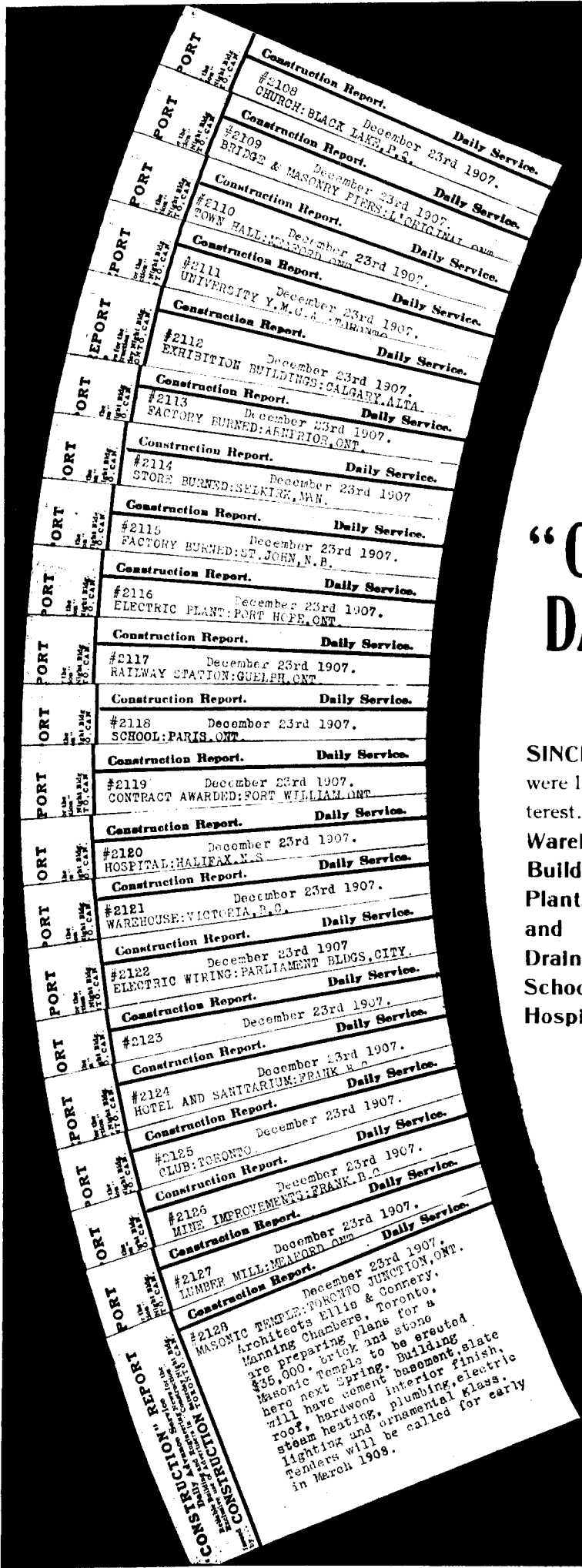
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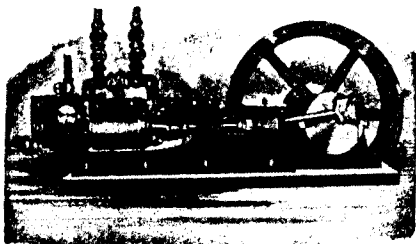
<i>Aitken, K. L.</i>	82	<i>Hyde & Co., Francis</i>	10
<i>Armstrong Cork Co.</i>	13	<i>Hynes, W. J.</i>	88
<i>Berg & Sons, A.</i>	84	<i>Ideal Concrete Machinery Co., Limited</i>	5
<i>Canada Plate and Window Glass Co.</i>	85	<i>King Radiator Co., Limited</i>	75
<i>Canadian Art Stone Co., Limited</i>	80, 81	<i>Linde British Refrigeration Co.</i>	90
<i>Canadian Concrete Machinery Co.</i>	15	<i>Metal, Shingle and Siding Co.</i>	85
<i>Canadian Fairbanks Co., Limited</i>	77	<i>Metcalf Engineering, Limited</i>	83
<i>Canadian Ornamental Iron Co.</i>	8	<i>McGill, David</i>	84
<i>Canadian Portland Cement Co.</i>	82	<i>Morrison Brass Mfg. Co., Limited, James</i>	9
<i>Chamberlain Metal Weather Strip Co., Limited</i>	87	<i>Ontario Iron and Steel Co.</i>	12
<i>Cluff Brothers</i>	3	<i>Ormsby, A. B., Limited</i>	86
<i>Colonial Dolomert Co.</i>	79	<i>Otis-Pensom Elevator Co.</i>	19
<i>Conduits Company, Limited</i>	82	<i>Parker, Clark & McEvoy</i>	90
<i>Dartnell, E. F.</i>	8	<i>Port Credit Brick Co., Limited</i>	84
<i>Deecker & Carlye</i>	88	<i>Pitt & Robinson</i>	18, 82
<i>Diezgen Eugene Co., Limited</i>	88	<i>Reid & Brozen</i>	83
<i>Don Valley Brick Works</i>	7	<i>Roman Stone Co., Limited</i>	14
<i>Drummond, McCall & Co.</i>	4	<i>Scientific System Brick Co.</i>	10
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<i>Galt Art Metal Co., Limited</i>	86	<i>Somerville, Limited</i>	20, and Back Cover.
<i>Gaudry, L. H. & Co.</i>	87	<i>Standard Ideal Co., Limited</i>	Inside Back Cover.
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<i>Hopkins & Co., F. H.</i>	16	<i>Turner Brothers, Canada, Limited</i>	82
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